

CA2 ALDGE
50 H24
Sept 28/50
Vol 4



The Province of Alberta

PETROLEUM AND NATURAL GAS CONSERVATION BOARD

Application for Permission to Remove or cause to be removed
Natural Gas from the Province of Alberta, under the Provisions of the
Gas Resources Preservation Act by Western Pipe Lines.

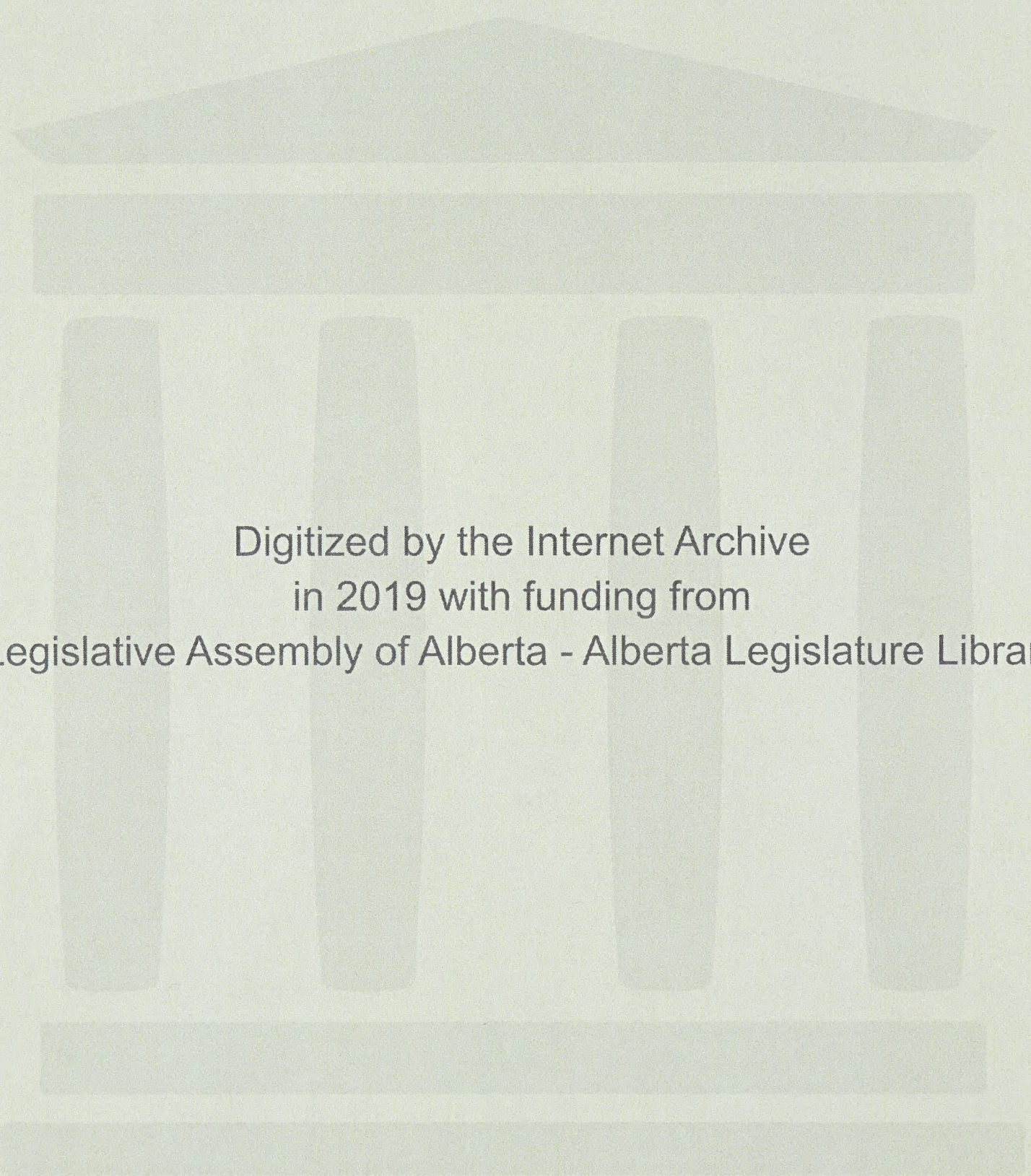
I. N. McKinnon Esq., Chairman

D. P. Goodall Esq.

Dr. G. W. Govier

Session: September 28th, 1950.

Volume 4.



Digitized by the Internet Archive
in 2019 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

I N D E X

VOLUME 4.

September 28th, 1950.

<u>W I T N E S S E S</u>	<u>Page</u>
Board Finding on Application for Joint Hearing	293
<u>LIONEL D. M. BAXTER</u>	
Direct examination by Mr. Martland	297
Cross-examination by Mr. S. B. Smith	303
Cross-examination by Mr. McDonald	311
<u>DAVID G. HAWTHORN (recalled)</u>	
Cross-examination by Mr. Fenerty	314
Cross-examination by Mr. S. B. Smith	327
Cross-examination by Mr. Macleod	331
Cross-examination by Mr. S. B. Smith	336
Cross-examination by Mr. Mahaffy	338
Cross-examination by Mr. McDonald	339
Cross-examination by Mr. C.E. Smith	345
Examination by Dr. Govier	349
<u>JAMES O. G. SANDERSON (recalled)</u>	
Cross-examination by Mr. Fenerty	363
<u>GORDON B. WHITNEY</u>	
Direct Examination by Mr. Martland	369
Cross-examination by Mr. McDonald	384
Cross-examination by Mr. S. B. Smith	400
Cross-examination by Mr. Nolan	406
Discussion re further hearings	408
<u>JAMES L. PARMELEE</u>	
Direct Evidence	412
Cross-examination by Mr. S. B. Smith	415
Cross-examination by Mr. Martland	416
Cross-examination by Mr. S.B. Smith	417

No.

E X H I B I T S

8	"Estimated Markets & Gas Requirements of Western Pipelines". Statement pre- sented by Mr. Whitney	369.
---	---	------

: : : : : : : : :

100

100

100
100
100

100
100
100
100
100
100
100
100
100
100

100

100
100
100
100
100
100

100

100
100
100
100
100
100

100

September 1950

E R R A T A

VOLUME 3

Line 18 last

word Should be

"years' supply from proved reserves and the balance of requirements from probable reserves".

instead of

"years proved reserves on the balance of the term of probable supply."

SECRET

SECRET

May 19 1961

Mr. [illegible]

Subject: [illegible]
Reference: [illegible]
Action: [illegible]
Status: [illegible]
Comments: [illegible]
Date: [illegible]
By: [illegible]

Page 1 of 1

Board Finding on Joint Hearing.

- 293 -

VOLUME 4.

September 28th, 1950.

THE CHAIRMAN: Gentlemen, we have a representative here from the Northern Natural Gas Company who would like to register as an interested party this morning.

MR. J. E. PARMALEE: Omaha, Nebraska. Northern Natural Gas Company.

THE CHAIRMAN: Gentlemen, I would like to make a statement on behalf of the Board relative to the arguments heard on Tuesday, September 26th, 1950, relating to the letters from Mr. Martland, the Western Canada Petroleum Association, the Minister of Mines and Minerals and the Right Honourable C. D. Howe.

The Board is prepared to hold a joint hearing on October 30th, 1950, for the purpose of hearing evidence, or further evidence, of all applicants and any interested parties in regard to reserves, deliverability and the requirements of the Province. It is our hope that all interested parties will take advantage of the joint hearing to see that the Board is provided with the fullest information on reserves, deliverability and Provincial requirements. We would like to stress that this information should embrace the following:

(a) The estimated reserves of gas for each pool, field or area within the Province together with the complete description of each such pool, field or area and the pertinent geological and engineering data; reserve data to show gas in place, gross producible reserves to reasonable well head abandonment pressures,

Board Meeting on Joint Hearings

- 223 -

VOLUME 11

September 28th, 1950

THE CHAIRMAN:

Gentlemen, we have a representative

here from the Northern Natural Gas Company who would like

to register as an interested party this morning.

Mr. J. E. FARMER:

Gentlemen, I would like to make a

Gas Company

THE CHAIRMAN:

Gentlemen, I would like to make a

statement on behalf of the Board relative to the arguments

heard on Tuesday, September 26th, 1950, relative to the

letters from Mr. Marshall, the Western Canada Petroleum

Association, the Minister of Mines and Technical Surveys and the

Honourable C. D. Howe.

The Board is prepared to hold a

joint hearing on October 3rd, 1950, for the purpose of

hearing evidence, or further evidence, of all interested

and any interested parties in regard to reserves, delivery

ability and the requirements of the Province. It is our

hope that all interested parties will take advantage of

the joint hearing to see that the Board is provided with

the fullest information on reserves, deliverability and

potential requirements. We would like to stress that

this information should embrace the following:

(a) The estimated reserves of gas

in each pool, field or area within the Province together

with the complete description of each such pool, field or

area and the pertinent geological and engineering data;

reserves data to show gas in place, gross producible re-

serves or reasonable well head abandonment pressures.

discounts (for processing shrinkage, lease, plant and field fuel, flaring and operational loss) and net gas available for disposition under the following categories:

- (i) Deferred on account of requirements for pressure maintenance or for other reasons having to do with the optimum recovery of oil or condensate.
- (ii) Within economic reach of a market, pipe line or practical grid system.
- (iii) Beyond economic reach of a market, pipe line or practical grid system.

(b) The estimated present and future deliverability of gas from each pool, field or area within economic reach of a market, pipe line or practical grid system together with the pertinent geological and engineering data; these data to indicate the present and future deliverability for a typical well within each pool, field or area as well as the total deliverability for the fully developed pool, field or area.

(c) The estimated present and future domestic, commercial and industrial requirements of the Province of Alberta for natural gas both as to average and maximum daily load;

(d) The manner in which the applicant proposes that the present and future requirements of the Province may be met from the existing reserves of gas, showing in detail and through a deliverability schedule how the annual and peak loads may be satisfied for a period of at least thirty years.

- 294 -

discounts (for processing shrinkage, lease, plant and field fuel, flaring and operational loss) and net gas available for disposition under the following categories:

- (i) Deferred on account of requirements for pressure maintenance or for other reasons having to do with the optimum recovery of oil or condensates.
- (ii) Within economic reach of a market, pipe line or practical grid system.
- (iii) Beyond economic reach of a market, pipe line or practical grid system.

(b) The estimated present and future deliverability of gas from each pool, field or area within economic reach of a market, pipe line or practical grid system together with the pertinent geological and engineering data; these data to indicate the present and future deliverability for a typical well within each pool, field or area as well as the total deliverability for the fully developed pool, field or area.

(c) The estimated present and future domestic, commercial and industrial requirements of the Province of Alberta for natural gas both as to average and maximum daily loads;

(d) The manner in which the applicant proposes that the present and future requirements of the Province may be met from the existing reserves of gas, showing in detail and through a deliverability schedule how the annual and peak loads may be satisfied for a period of at least thirty years.

Board Finding on Joint Hearing.

- 295 -

(e) The manner in which the applicant proposes that the present and future requirements of the areas to be served outside the Province may be met from the existing reserves showing in detail and through a deliverability schedule how the annual and peak load requirements may be satisfied for a period of at least twenty years;

In connection with the question of deliverability, the Board expects to receive some assurances from the various producers to the effect that, given a market, they would be prepared to drill the number of wells required to meet the deliverability schedules.

We propose to continue on with the hearing of Western Pipe Lines application now and the Prairie Pipe Lines application on October 10th, leaving it up to the applicants themselves what evidence they intend to adduce.

We are not prepared at this time to make a statement with respect to the point raised by Mr. Martland relating to choice of routes being referred to the Board of Transport Commissioners. Should the disposition of applications be decided without reference to the Board of Transport Commissioners, the Board at the request of any applicant will hear any further evidence an applicant may wish to present with respect to any matter relating to other than reserves, deliverability and Provincial requirements. In the meantime any applicant should file such evidence with the Board.

In view of the foregoing, the Board would like to hear from Westcoast Transmission

Board Finding on Joint Hearing.

- 296 -

Company and the Northwest Natural Gas Company and Alberta Natural Gas Grid, Ltd. as to whether or not they intend to present any further evidence on the adjournment dates of their respective hearings, namely October 23rd and November 6th. One reason for requesting this information is that the Board has in mind scheduling around October 23rd, 1950, a hearing under The Oil and Gas Resources Conservation Act on oil proration.

MR. NOLAN: I am instructed, sir, that so far as the Northwest Company is concerned it is our intention and our desire to lead some further evidence on the question of reserves, deliverability and the needs of the Province. Further than that we have no further evidence to offer.

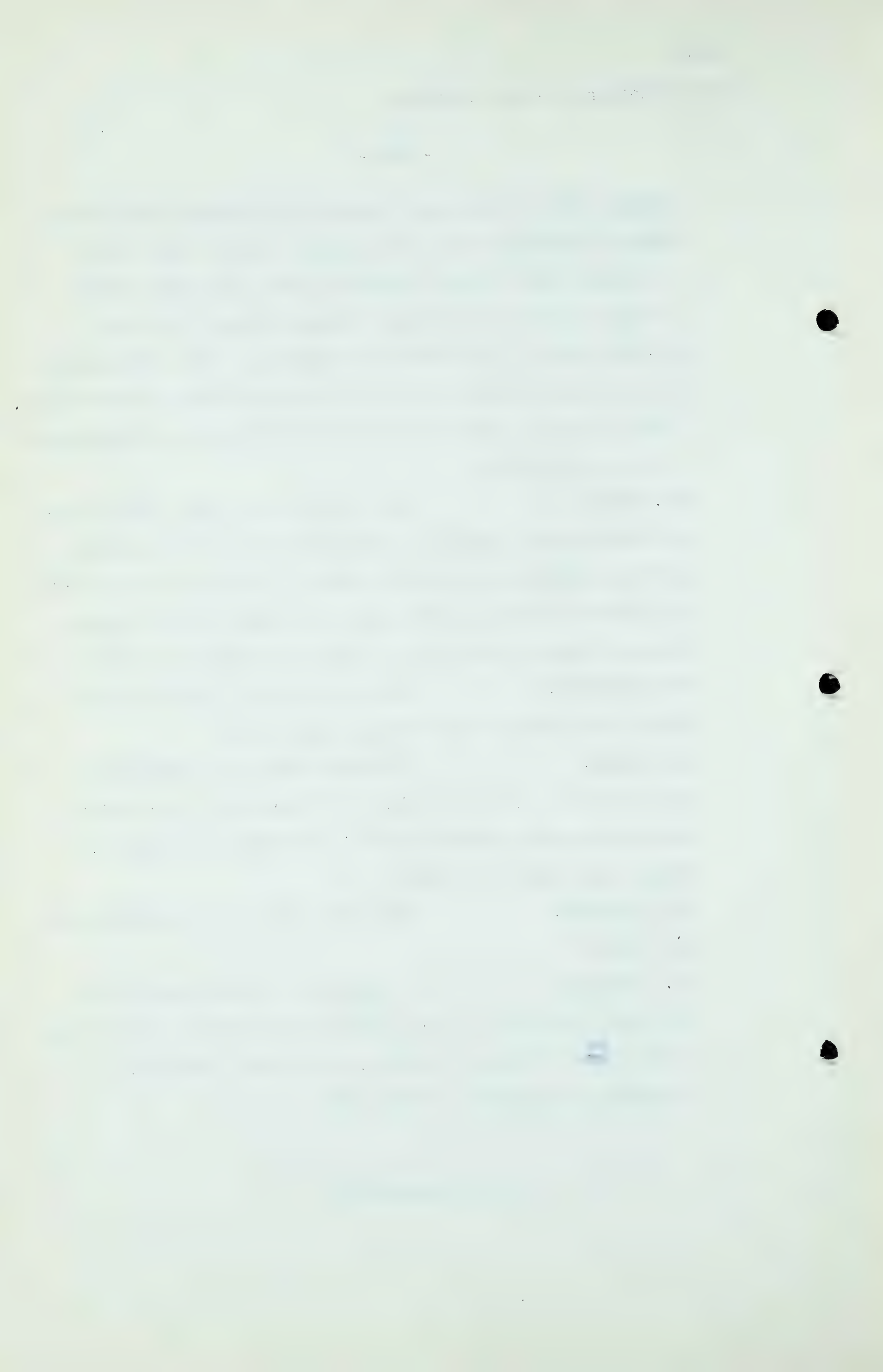
THE CHAIRMAN: Do you intend to adduce that on Monday, the 23rd, or at the joint meeting?

MR. NOLAN: Whichever meets the convenience of the Board. I think perhaps if **there** is to be a joint hearing we would properly lead it at that time, namely, Monday, the 30th of October.

THE CHAIRMAN: That would meet the convenience of the Board.

MR. McDONALD: In regard to the Westcoast, Mr. Chairman, it would be our intention to lead our evidence on October ³⁰~~19~~th, during that week, and we will abandon, if necessary, therefore, November 6th.

(Go to page 297)



- 297 -

MR. MARTLAND: If it meets the convenience of the Board I would like to have Colonel Baxter give his statement at this time.

LIONEL D. M. BAXTER, having been duly sworn.

Mr. Chairman and Gentlemen: I regret very much that I was unable to be here for the opening of our hearing, because I had intended to make a statement then, but it was impossible. This morning I would like to outline for the information of the Board just why we are interested in the development of a pipe line for Alberta to convey natural gas across the Prairie Provinces and into the State of Minnesota. I propose to tell you, and it probably is well known, that our firm started in Western Canada, in Winnipeg, in 1883 and since that time we have been most active in the development of the Prairie Provinces. We have assisted in the building of railroads, one being the Calgary-Edmonton Railroad and the Q. L. & Q. in Saskatchewan. As a result of our operations we have accumulated very substantial blocks of mineral rights in the Prairie Provinces, approximately $1\frac{1}{2}$ million in Alberta and around 1 million in Saskatchewan, and probably 300,000 in the Province of Manitoba. That, of course, brought us very close to the oil industry at the beginning. I believe that I would be right in saying that we conducted the first geological survey in this Province. We employed a geologist from the United States and an assistant and a survey was made from North of Edmonton down to the International Border. It cost us \$30,000, and \$30,000 in

- 298 -

those days was different from \$30,000 today. From then on our companies, for whom we act as general managers, sold the land and retained the mineral rights and we have been involved in oil and gas development in this Province ever since. We have spent very substantial sums running into several millions of dollars in the search not only for oil but also for gas. We know that the economy of the three Western provinces is tied in and what would be of advantage to Manitoba and Saskatchewan would also be of advantage to Alberta. Our companies were very interested in finding an outlet for the residue gas, if any, in this Province. In addition to that, we were interested in the industrial economy of the Western Provinces. I feel that the concentration of industry in Eastern Canada is detrimental to the Western people, and I have spoken publicly on the subject and the fact that we have natural gas here would, if made available, aid in the industrial development of Western Canada. It would attract smaller industries to our Western towns and we find in times of industrial depression that the suffering of the people is not nearly so heavy where you have a diversification of industry. It was my opinion that by making this gas available to the town and villages through our proposed pipe line it would bring industries to the West, and I am very much convinced, as I have said, that the economy of these three provinces is tied together. Alberta cannot go on by itself. The economy of the three is locked up. Therefore, anything that can be done to help the prairie provinces, other than Alberta also helps Alberta.

L. D. M. Baxter,

- 299 -

For that reason, I have given a great deal of thought to the finding of an outlet for gas which our companies own, and secondly, to the possibility of the building of a pipe line. It was evident from the first that a project of this size would involve considerable money to provide this capital. We have now associated with Wood, Gundy & Company, together with Nesbitt Thomson & Company, who are both well known financial houses in Canada, and International Utilities of New York, of which I am a director and which controls the two gas companies here and in Edmonton and connecting lines. Now, much has been said publicly on the subject. I have had as long an experience in this business as anybody in Alberta in the industry, and I am of the opinion that before any question of export is granted that we are going to have to find more gas than is presently available to support any pipe line. I am not a geologist or an engineer but I have had a lot of experience and I say that it is idle to talk about export of gas unless we have more. It is our desire that the Board, as quickly as possible, gives some incentive to the development of gas. I do not need to support my statement because you are well aware of the great difficulties that present themselves in giving this incentive to gas and at the same time taking care of the oil side of the industry. The Government must provide this incentive for the exploration of gas and deal later with the subject of export. We have exactly the same problem in connection with the mineral rights of our own companies. In many instances their acreage is not in solid blocks but

scattered throughout the government acreage and we have ourselves to find a formula for the exploration of gas. But I do feel at the moment it is the most important thing before your Board and before the Government of Alberta, to find ways and means of encouraging further exploration of gas in this Province. The question of who is going to get the right to export is something that can come later on. I personally have great hopes that no choice will be made by any governing body that overlooks the citizens of these prairies, all of whom have a personal and direct interest in the resources of the prairies. But be that as it may, I do suggest to the Board that one of the first things that should be done is to offer an incentive under proper regulations, so that we can then pool our efforts with the Government and carry on this exploration for additional gas.

(Go to page 301.)

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

11-1

Col. L.D.M. Baxter,
Dir. Ex. by Mr. Martland.

- 301 -

A Figures that I have seen that have been published in the press, whether they are correct or not, in regard to taking gas to the Northwestern States and in regard to taking gas to Eastern Canada involve very large amounts. Personally, I was asked over a year ago to look into the question of taking gas to Ontario and I could not be convinced that it was economically feasible to take a line across a thousand miles of rock and muskeg and make it pay at the other end. But over and above all that, the market that can be served in Eastern Canada is of a magnitude that I am quite sure the gas is not available in this Province if you are going to reserve sufficient for the people of this Province at this time, which means that we are discussing a hypothetical case that in 5 or 10 years from now may be feasible, but I do not think it is feasible today. We have, as you know, requested the right to take gas into Minnesota. We feel that the development of that iron range and low grade ore is equally important to the general effort of Canada and the United States in the war effort, and if it is feasible that is the logical route for gas east, take it in bond or by agreement and distribute it between there and Detroit. The cost will be much less and the market could be served if, as and when the gas is available in this Province.

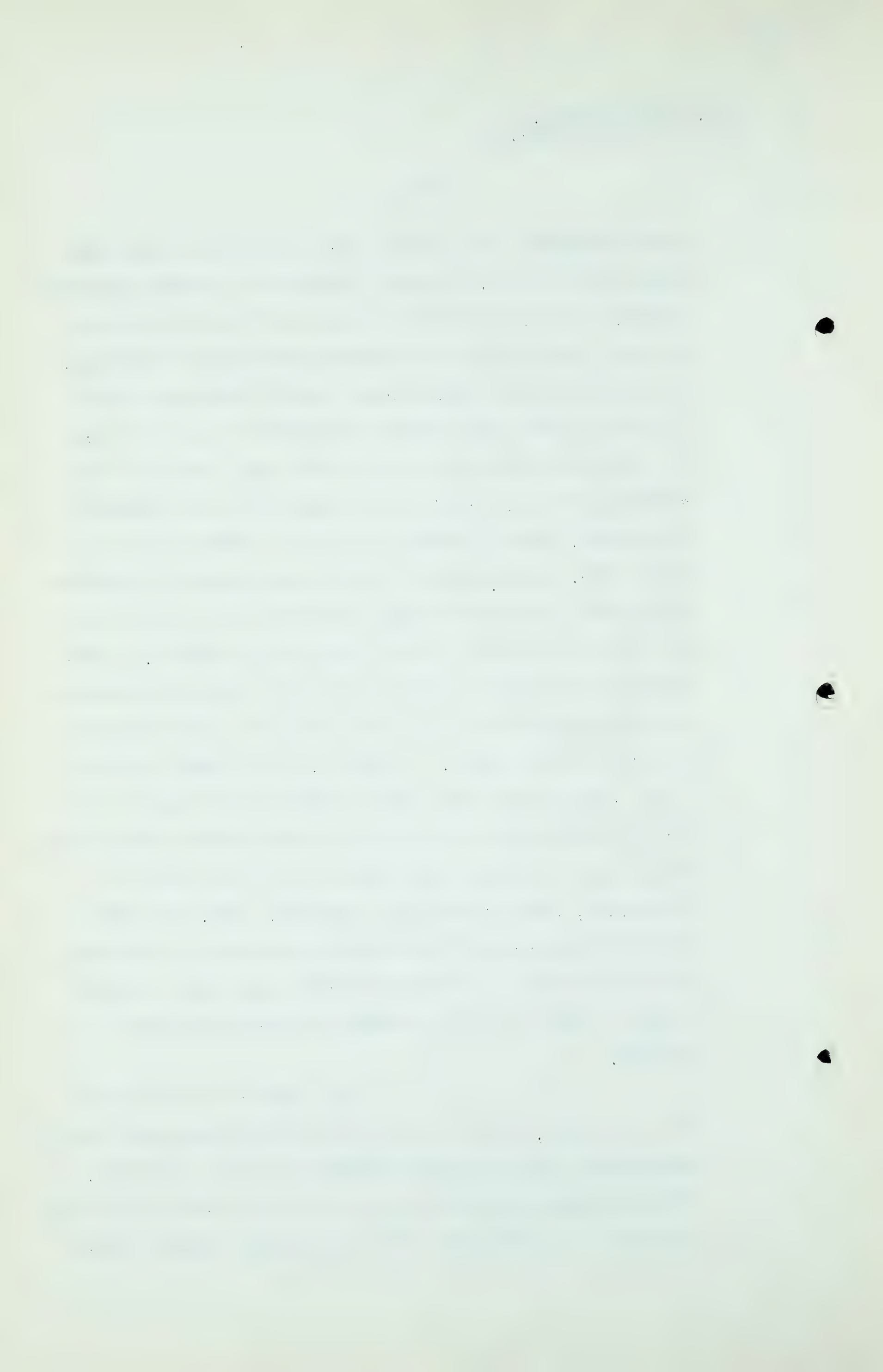
I do not want to unduly labour the point, Mr. Chairman, but I have to sit on both sides of the fence in this matter. I have to sit as a producer representing shareholders who have a substantial interest in the reserves here in Alberta. I also have to come before

Col. L.D.M. Baxter,
Dir. Ex. by Martland.

- 302 -

you as President of a Company that desires to market gas from this Province. Now, we ourselves are endeavouring to increase the gas which we have now for the company which we have organized but any general development of new gas, delineation of the fields where we know there are one or two wells today that have been shut down because of lack of market, will require a lot of drilling. And it is not something as you, from your own experience as Chairman of this Board, are well aware; it is not something you do every year. Looking back over the long history of Alberta development, we know how many hundreds of dry wells that have been drilled and it will take, in my opinion, a considerable time before the Board or even before any company is in the position to go to the public to raise money and say, "We have got gas". Therefore, I do submit on behalf of my company that the urgent matter at the moment is to find ways and means for giving an incentive for the drilling of gas and for regulating between the oil and the gas industries, both of which are involved. There are some very serious problems that may arise when gas is developed in the field and oil discovered later, but that is not a subject I think I should attempt to discuss here this morning.

All I want to conclude with is to say this, that as a citizen of this country who has spent years advocating the development of its resources, first in mines and then in oils, all that I can do with the resources at my disposal, will be done and I shall battle



Col. L.D.M. Baxter,
Dir. Ex. by Mr. Martland,
Cr. Ex. by Mr. S.B. Smith.

- 303 -

as long as I have the power to say a word to prevent any disposition of those resources before taking care of the Prairie Provinces.

Q MR. MARTLAND: Just to complete the record, Col. Baxter, in addition to being president of the applicant company, Western Pipelines, you are the President of Osler, Hammond & Nanton, Limited of Winnipeg, and of the Calgary & Edmonton Corporation?

A That is correct.

Q In some of your references where you use the word "we", it is related to these two companies?

A To those two companies. In addition to that, Security Freeholds has a substantial interest, and other companies that we manage.

Q And you have been a resident of Western Canada - -

A Ever since I came back from the first war.

THE CHAIRMAN: Does anyone wish to question Mr. Baxter?

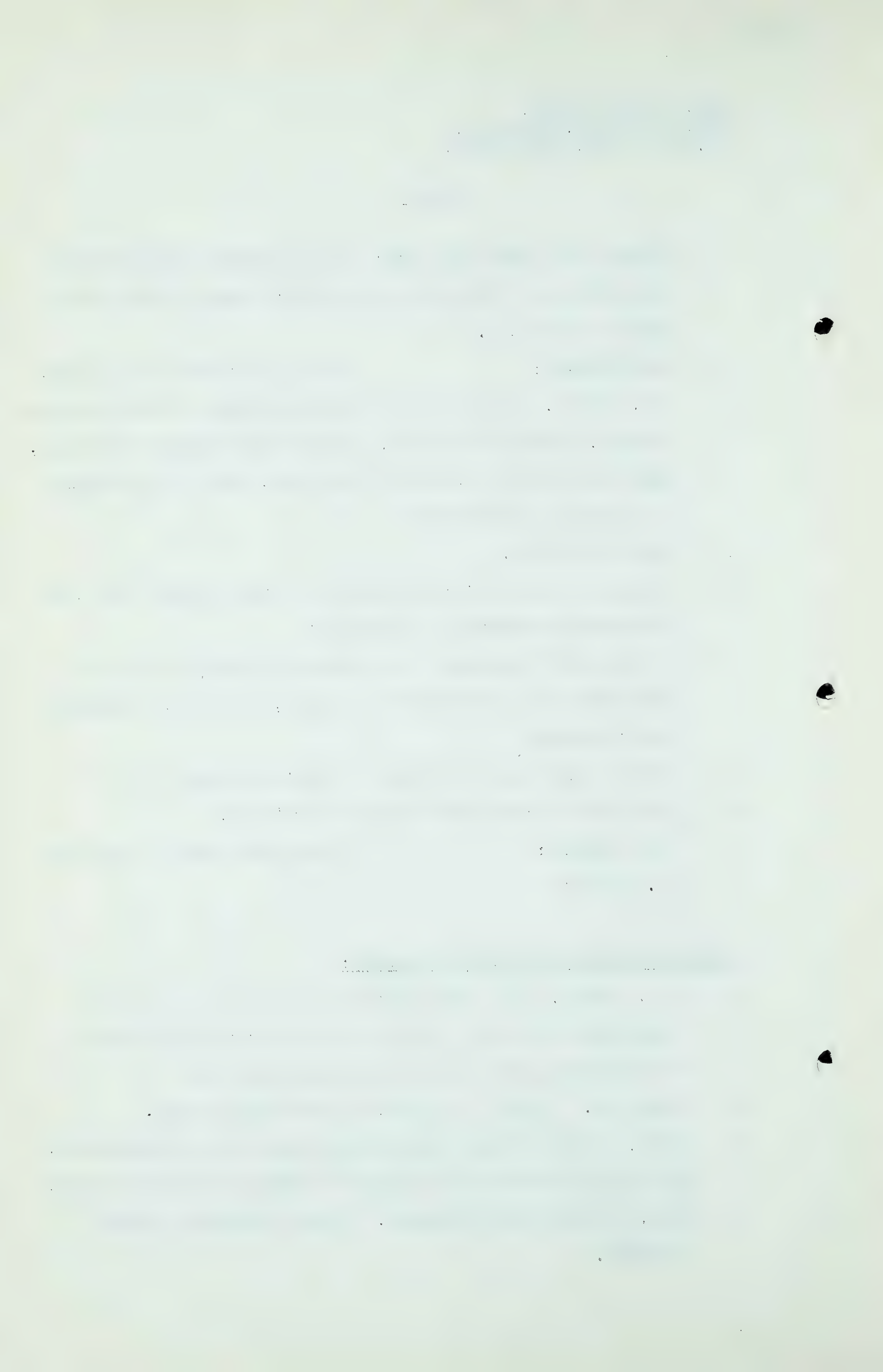
CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Col. Baxter, did I understand you correctly to say that associated with this project which you are representing or presenting here is International Utilities?

A Quite so. I think it appears in our application.

Q Well, I have not your application before me at the moment. Are you an officer or director of International Utilities?

A Yes. I made that statement. I am a director of that company.



Col. L.D.M. Baxter,
Cr. Ex. by Mr. S.B. Smith.

- 304 -

Q And I think you indicated that International Utilities controls Northwestern Utilities in Edmonton and the Canadian Western Natural Gas Company in Calgary, the two companies which supply respectively the people of Edmonton and of Calgary?

A Yes, that is a well known fact, I think.

Q Now you did say that large amounts of gas were involved in export projects of the nature of yours, or words to that effect?

A Yes.

Q Again I have not your application before me. Could you tell me approximately what number of million cubic feet per day would be required to fulfil the demands of a system such as that proposed for Western Pipelines?

A I have not that information in detail exactly before me but I believe it is in the neighbourhood of 225 million feet, that is, including the Minnesota end.

Q 225 million feet per day?

A Per day.

Q That is an average figure, I suppose?

A That is an average figure.

Q Well now, you have on your behalf put forward Messrs. Lewis and Hawthorn who have been presenting this brief on behalf of your company, Western Pipelines Limited?

A That is right.

Q And you are familiar with the contents of that brief, I suppose?

A I am sorry that I am not. I have only seen extracts from it because actually I have been engaged in a very heavy

Col. L.D.M. Baxter,
Cr. Ex. by Mr. S.B. Smith.

- 305 -

convention which has only recently finished. Much of this work had to be carried on without me.

Q You would be familiar with the nature of it as representing Western Pipelines Limited?

A I am, yes.

Q And this brief is put forward on behalf of your company?

A Yes.

Q So I suppose it is fair to say that the brief was authorized and approved by your company?

A Oh, quite, no question about it.

Q I do not want to go into this in great detail because I understand you are not a geologist or engineer, and I am not either, but presumably you are familiar with the fact that that brief suggests that there is estimated marketable gas in Alberta of 5 trillion 614.1 available estimated marketable gas?

A Yes.

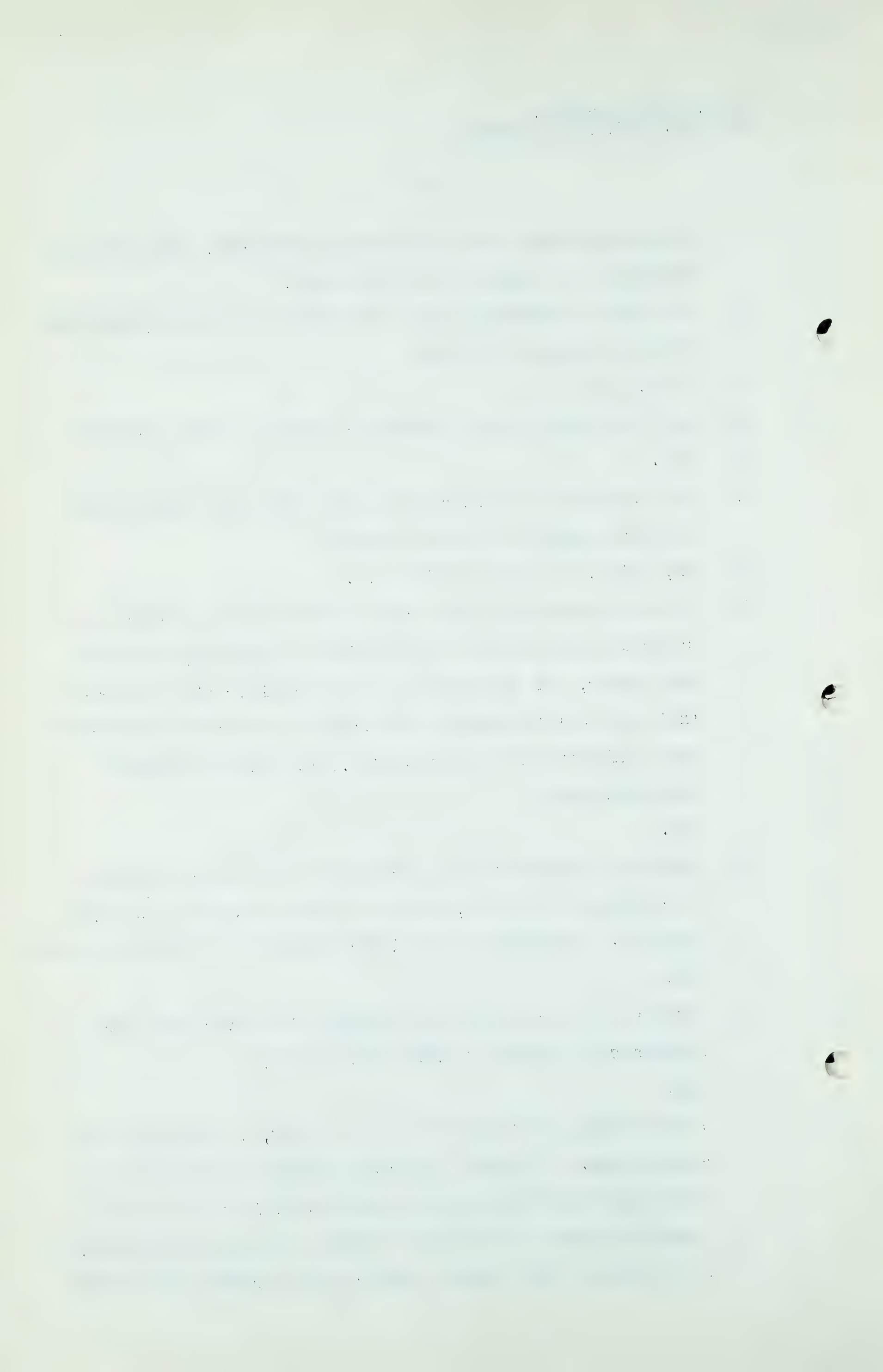
Q Under the column "Gas Not Available" is given the figure 2 trillion 970 billion, which is either dedicated or under contract, or assumed to be either dedicated or under contract?

A Yes.

Q And that they have under the heading "Gas Available for Pipelines" a figure of 2,251,000,000,000?

A Yes.

Q I am reading the figures from your brief, I think you can accept them. I think it is fair to say in conjunction with that that there are of course qualifications in the report and some of those are proven and some are probable, but those are the figures that are put forward before this



Col. L.D.M. Baxter,
Cr. Ex. by Mr. S.B. Smith.

- 306 -

tribunal by your company?

A Yes.

Q And can you tell me whether if 2,251,000,000,000 is available for pipeline purposes, if it is, because I am not saying whether it is or it is not at the moment, whether you consider that is sufficient for the purposes of your line?

A Well, Mr. Smith, I have not before me the decision of this Board as to what Alberta will require. I am quite sure they will protect the citizens of Alberta. It may well be that they will find no surplus.

Q That may be, we can not say.

A Therefore it is impossible for me to say at this moment whether those figures provide sufficient gas for us or not.

Q But your engineers, geologists rather, Messrs. Lewis and Hawthorn, I take it from this brief, have set aside 2,970,000,000,000 as in their opinion, with such qualifications as are stated in this brief, as being sufficient for the requirements of Alberta according to either Mr. Lewis or Mr. Hawthorn yesterday for 37 years ahead. Are you familiar with that?

A No, but I understood - - my understanding was that, while I have no information other than public statements in the press, that 50 years was the amount that would be required.

Q Well, I had rather understood that too, but 37 years was the maximum figure, as I recall it, that was mentioned by your geologists in their evidence, and that is the figure which is given, the result of the figure that is given in their brief. That was the submission made here yesterday by Mr. Hawthorn or Mr. Lewis, was it? Mr. Hawthorn, I

Col. L.D.M. Baxter,
Cr. Ex. by Mr. S.B. Smith.

- 307 -

think, wasn't it? You were not familiar with that?

A No.

Q You do concede that Alberta is a Province that is rich not only in oil but in gas, potentially at least?

A I do.

Q And that there probably will be available for export very large quantities of gas?

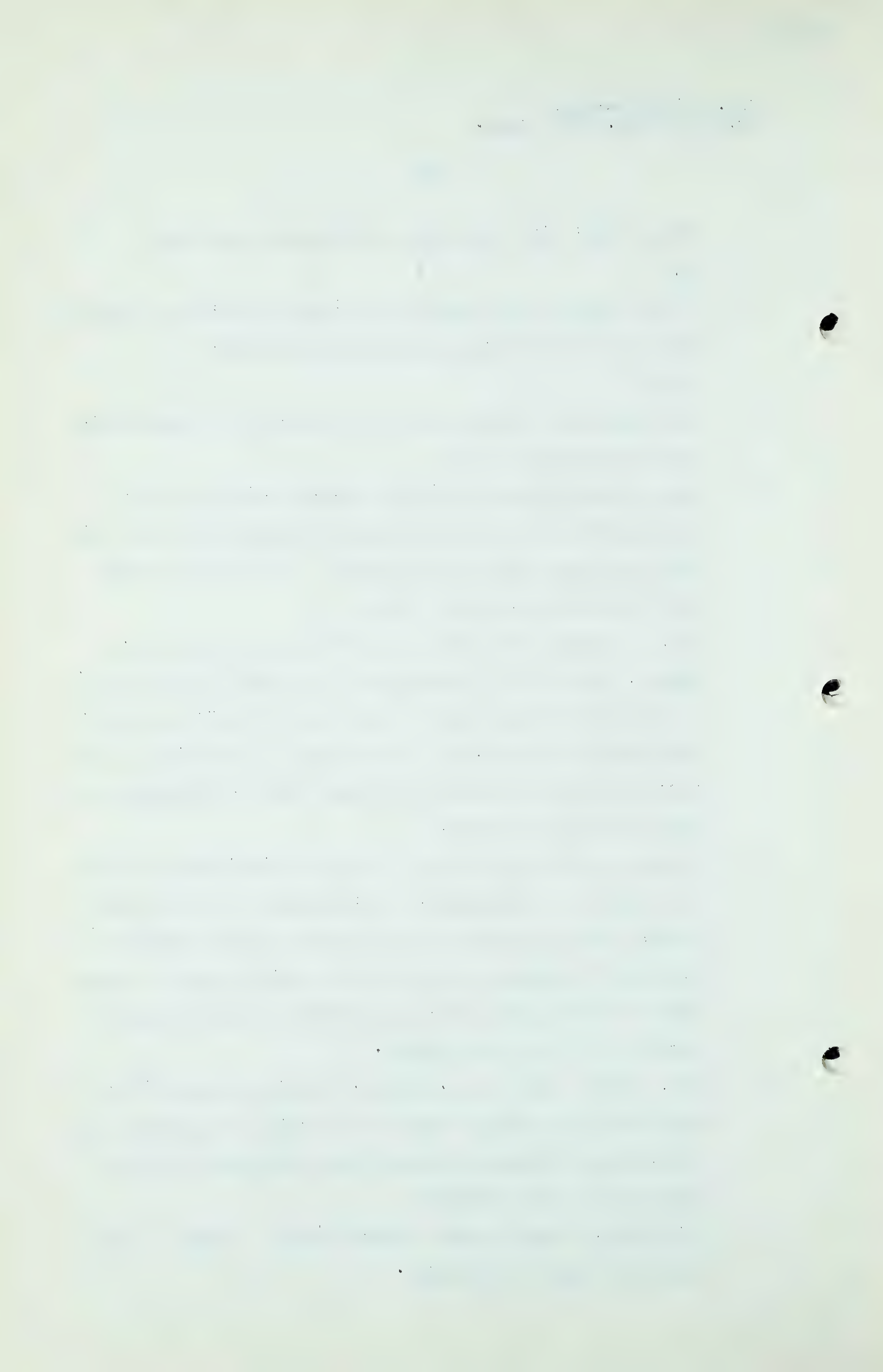
A Well, I would hope that in due course there would be. Nothing that I said in my evidence precluded the fact that additional gas would be discovered. I am talking about the situation as I see it today.

Q Yes. I suppose it would be correct to say also, Col. Baxter, that in the interests of the people of Alberta if we are going to have gas for sale and if there are available markets for gas, we should secure those markets, such markets as are available to us when they are available for fear we might lose them?

A We have in the early history of this country adopted that attitude to our detriment. I think myself it is a great mistake because a market for a certain natural reserve is available to immediately seize that market without looking down the road to the future and making certain we want some of it in our own country.

Q Yes, I quite agree, Col. Baxter. Living in this Province and knowing the value of gas to the people of Alberta that the people of Alberta certainly have first call on the resources of this Province.

A Of course, I take it into a wider field. I take it into the three Prairie Provinces.



Col. L.D.M. Baxter,
Cr. Ex. by Mr. S.B. Smith.

- 308 -

Q I think there is much to be said for the theory that gas should be available to Canadians. I am in substantial agreement with you on that, but if you have a surplus of gas then it is the part of wisdom, looking ahead a long way as far as we can, to conduct ourselves so that we do not permanently lose such markets for export gas as are available to us. You would agree with that statement, would you not?

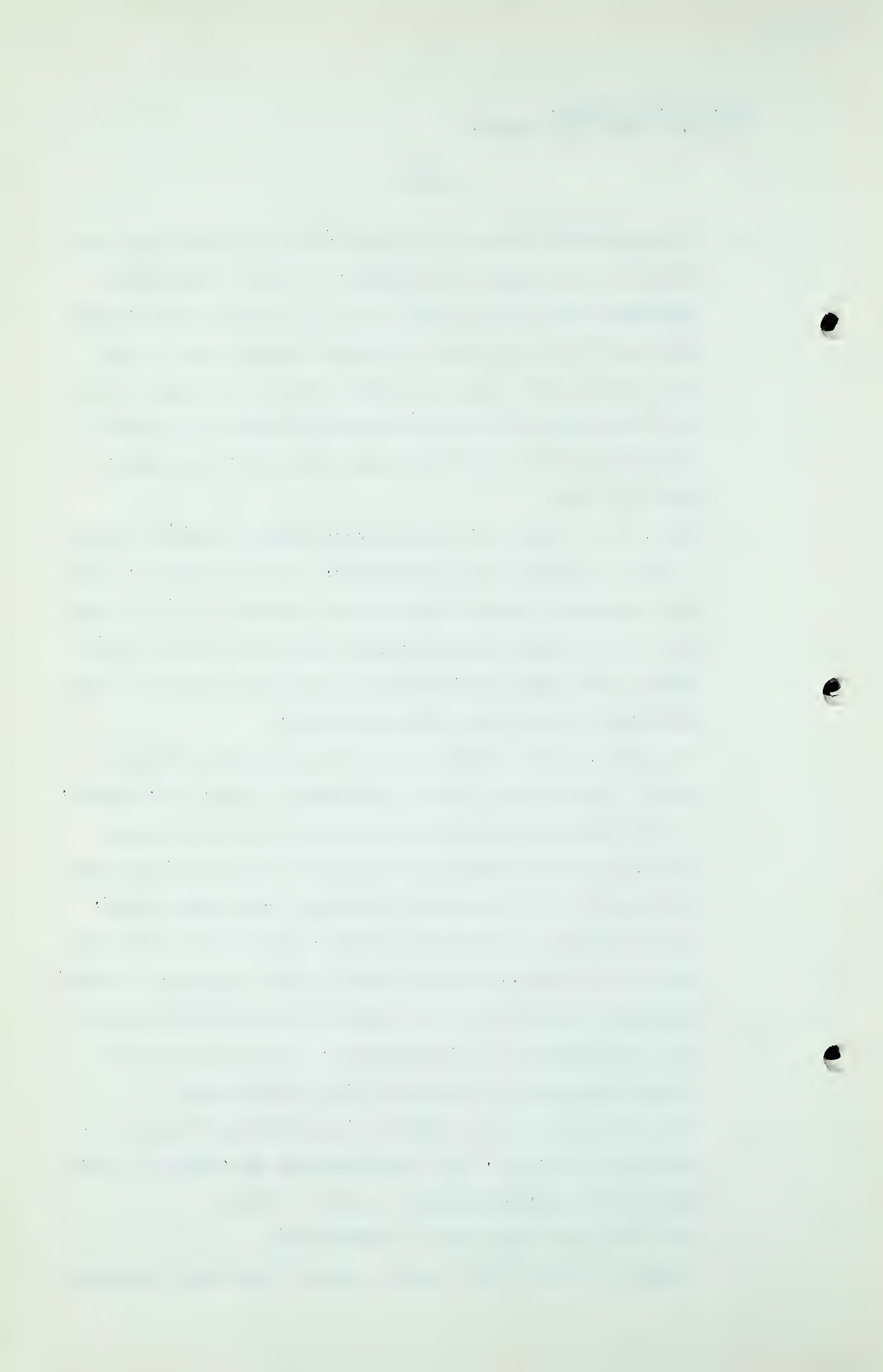
A Well, your opinion on this subject and mine differ because I feel, personally I am convinced, as I said before, that when the Board has all the evidence before it of all those who wish to make representations, they are going to find that at the moment marketable gas in this Province is not sufficient to meet any large pipeline.

Q Of course, at the moment I am not talking about whether there is sufficient gas at the moment or not, Col. Baxter, I am talking on the theoretical plane, if at any given time Alberta has available a surplus of gas over and above the needs of its own people for many, many years ahead, and if there are available markets, it would be well under those conditions, if we ever want to sell our gas, to conduct ourselves so that we do not preclude ourselves from entering such markets as are available. Would you not agree on that statement, subject to those conditions?

A You are trying to put words in my mouth that I am not prepared to accept. As a business man, Mr. Smith, I have had a little experience and I have to decide - -

Q You have had a great deal of experience.

A I have to decide when I have a matter before me, speaking



Col. L.D.M. Baxter,
Cr. Ex. by Mr. S.B. Smith.

- 309 -

personally, whether to abandon a certain project because I can not see into the future how at the moment I can take care of it or else go ahead with it, and if I can give my short answer to your question, it is that you are building a hypothetical case.

Q You just are not prepared to answer?

A No, I am not.

Q I am not trying to put any words in your mouth or urge you to answer. I am just seeking to ascertain what your views are. Have you read all the evidence and the briefs submitted to this Board by the well-trained?

A I have read some of them.

Q Not all of them?

A If I had the time available. Others of my staff have read them.

Q I am not complaining about whether you have or have not, I simply want to ascertain whether you have?

A Some of them I have.

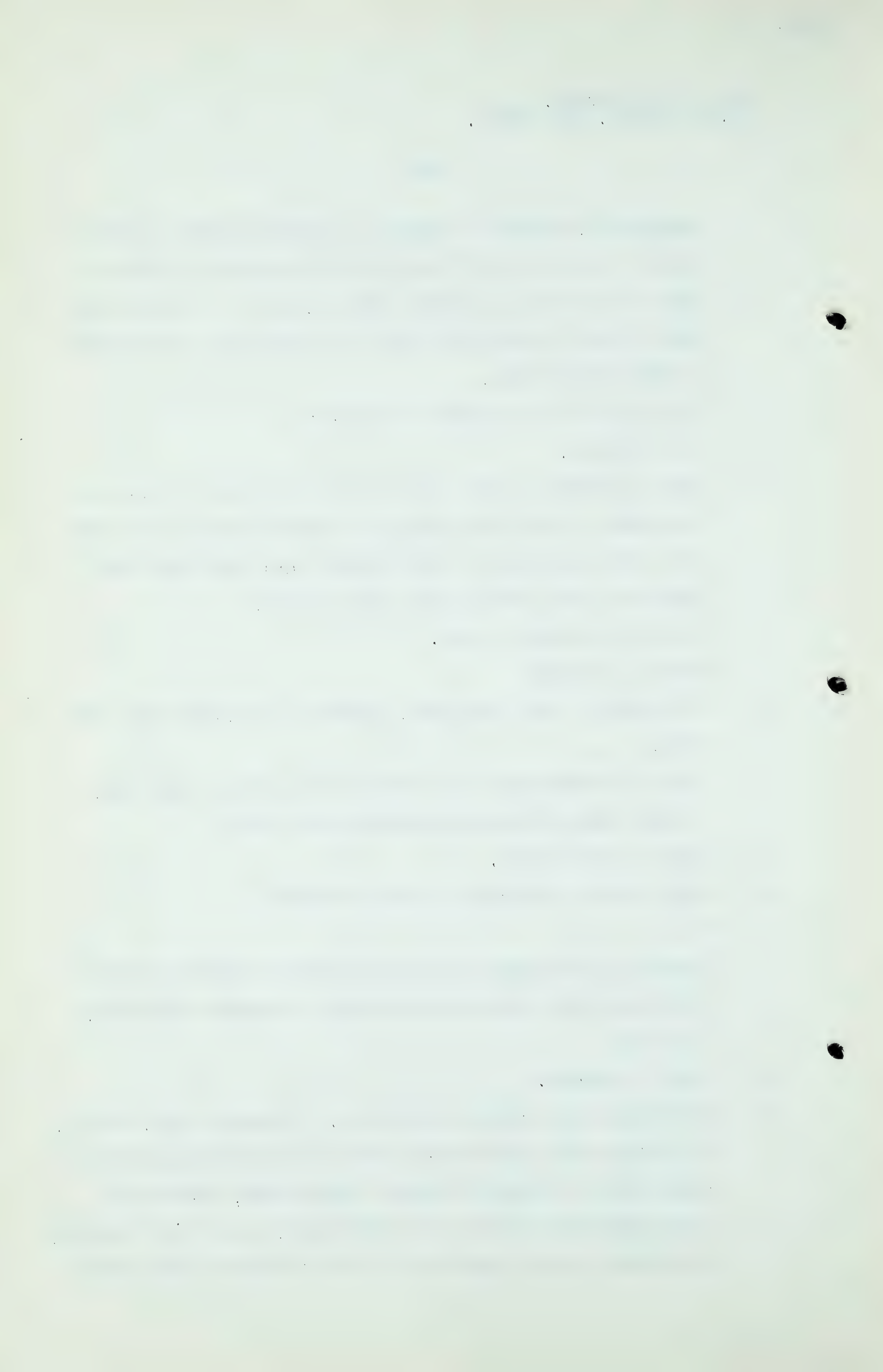
Q What portion I suppose you can not tell?

A No.

Q Because you have manifold other duties to perform besides carrying on the business activities of Western Pipelines, I assume?

A That is correct.

Q Excuse me just a moment, would you. I suppose, Col. Baxter, you being a very experienced executive would be prepared to agree that in technical matters businessmen, Boards and Courts have to rely upon the investigations and the testimony of men who are well qualified in the technical field under



Col. L.D.M. Baxter,
Cr. Ex. by Mr. S.B. Smith.

- 310 -

consideration?

A I think that is an established practice in business.

Q Yes, and when you speak of the gas resources of this Province, that is your own opinion as a layman?

A As a layman with the experience that I have had.

Q As a layman with the experience that you have had?

A Over 25 years.

Q And such of the technical data as you have read, and you have not read all of it that is before this Commission?

A No.

Q You would not pretend to suggest to this Commission that your evidence is on the same plane as technically qualified men, geologists of many years experience and with knowledge and experience in other gas fields?

A I have expressed a personal opinion.

Q Yes.

A I am quite certain that the Chairman of this Board and his assistants will arrive at a conclusion based on all the evidence he receives.

Q I am sure. And that is your personal opinion as a layman?

A Yes.

Q That is correct?

A Yes.

Col. L.D.M. Baxter,
Cr. Ex. by Mr. D.P. McDonald:

- 311 -

CROSS-EXAMINATION BY MR. McDONALD:

Q I might ask Mr. Baxter one or two questions, sir. I would just like you to amplify, if you would, this matter of incentive. As I understood you, you suggested to the Board that the important requirement at this time was some incentive to further development of the gas reserves, gas resources of the Province?

A That is my opinion.

Q I just did not get it clear from your statement as to how you were suggesting to the Board that this incentive could be provided?

A I would not attempt to suggest to the Board because as far as our own mineral rights are concerned we can decide ourselves how we will provide for gas leases and oil leases. The Board is a Government Commission, has an entirely different function to ourselves and I would not offer any suggestion as to what they might do. We, in our leases which we grant, we ask that all our lessees comply with Government regulations, and it is not for me to suggest what the Board should do. I am only urging them that something should be done.

Q Well, I wanted to know whether you were going to go further and suggest what these regulations were?

A No.

Q Now, there is one thing that has occurred to me, Mr. Baxter, with regard to your particular line. Reading Dr. Hume's report particularly, there seems to be a geological condition, as it were, in the Provinces of Manitoba and Saskatchewan which may lead eventually to discovery of

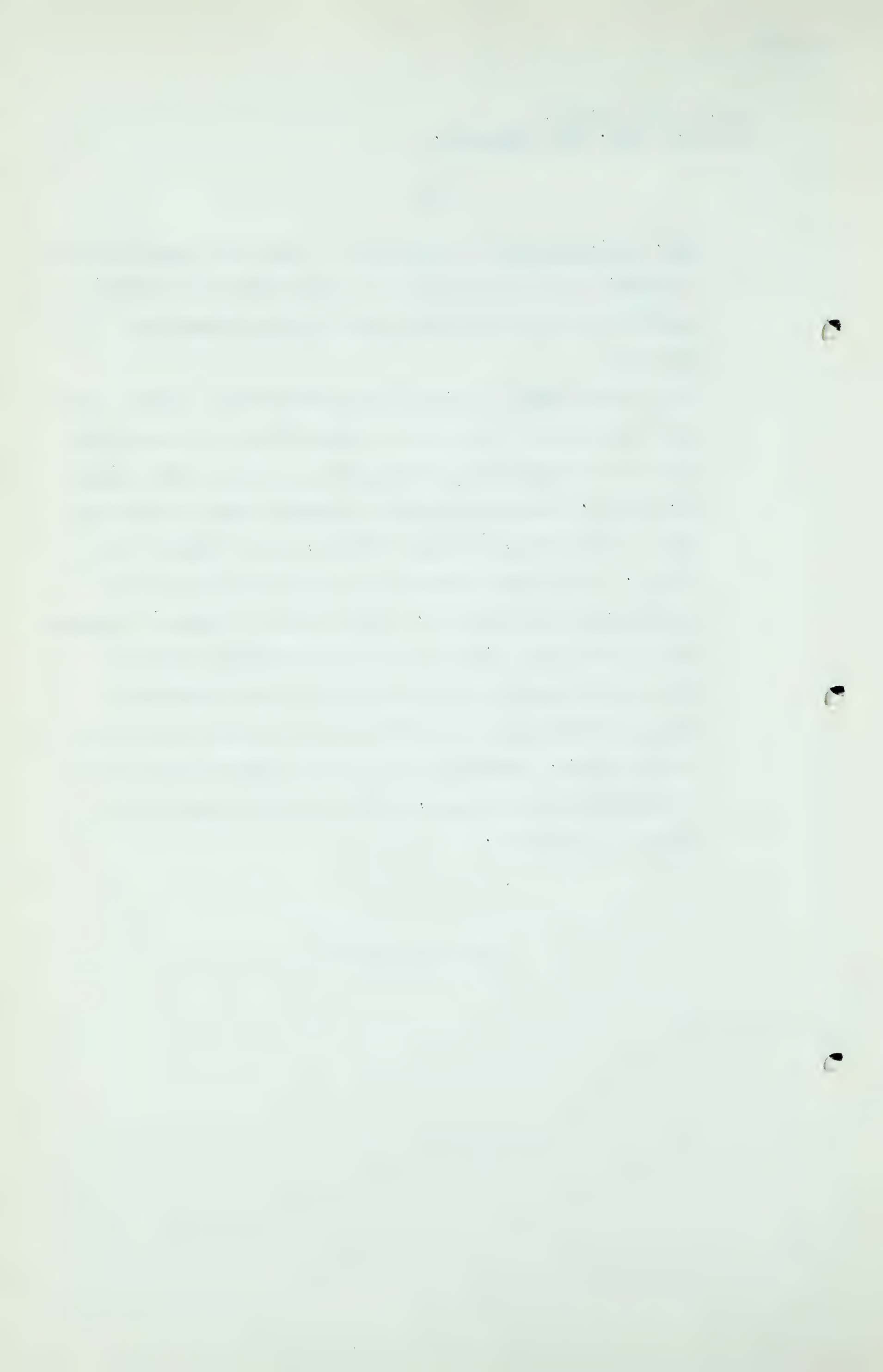
Col. L.D.M. Baxter,
Cr. Ex. by Mr. D.P. McDonald.

- 312 -

gas. Now, what is the position, or has your company given consideration to this position in the event substantial quantities of gas are discovered in Saskatchewan and Manitoba?

A Well, there again you are looking down at the future. The only thing that I can tell you about that is that as president of a company that during the war years spent almost \$4,000,000.00 in the Province of Saskatchewan and drilled some eleven holes, I believe it was, we got 75,000 feet of gas. Now, I am convinced gas will be discovered in Saskatchewan and Manitoba. That is only a layman's opinion but the evidence given to us by geologists is that the whole basin from the Rockies as far as the Cretaceous extends offers the possibility of oil and gas but that is in the future. We can not deal with something that we do not know what will happen, whether it will take 5 or 10 years to develop it.

(Go to page 313)



L. D. M. Baxter,
Cr. Ex. by Mr. McDonald.

- 313 -

Q Yes. Well, wouldn't it be something that the Province of Alberta should take into account in determining what should happen to Alberta gas which is committed for export, and the gas which is discovered in Saskatchewan and Manitoba in competition with it, is that something that should be taken into consideration?

A I am afraid I cannot see how that can be taken into consideration at this time at all. The new generation will have to face up to that. I do not think the present one will.

Q All right. Just let us go one step further, Colonel Baxter, would you agree with me that if this Board should determine fairly soon what the requirements or purported requirements for Alberta for the reasonable future are going to be, would that be any help in encouraging further gas discoveries in this Province?

A I thought I had said that indirectly, but I think that is one of the essential things; until we know what Alberta requires any additional gas figures are meaningless.

Q Yes. And any statement as to the effect of what is surplus is also part of the incentive that you speak of?

A Yes.

Q And that is one purpose of your company making this application at this time, to assist in arriving at those?

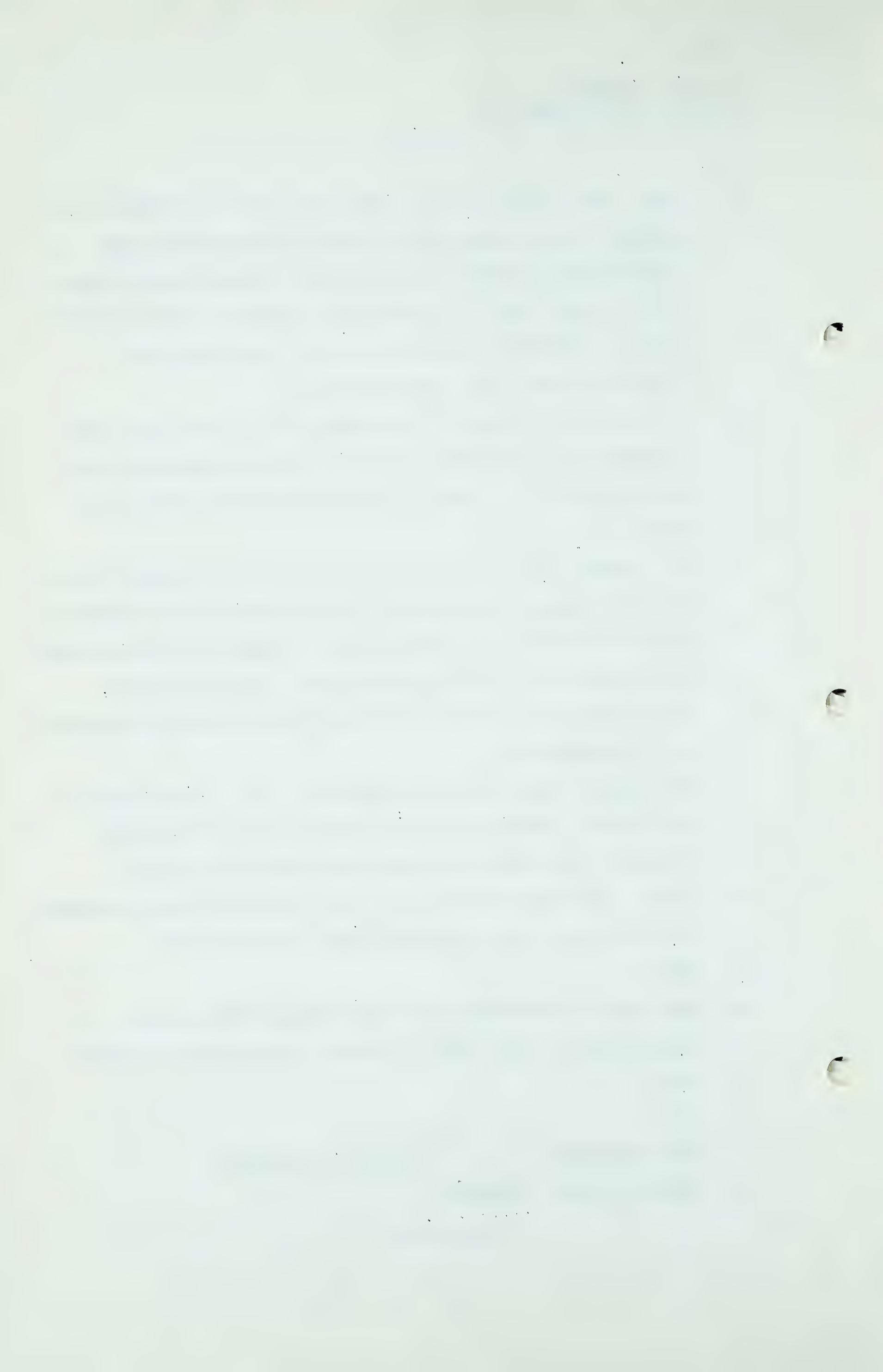
A Yes.

Q Yes.

THE CHAIRMAN: Thanks, Mr. Baxter.

A Thank you, Mr. Chairman.

.....



David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 314 -

DAVID G. HAWTHORN, (recalled)

already sworn:

THE CHAIRMAN: Were you through yesterday, Mr. Fenerty?

MR. FENERTY: I beg your pardon?

THE CHAIRMAN: Were you through with your examination yesterday?

MR. FENERTY: Did I conclude it, you say?

THE CHAIRMAN: Yes.

MR. FENERTY: Well, I realize that I took some time but there is one point that I left out in the middle, and I went down another alley. I would like to ask a few questions on that. Isn't Mr. McDonald going to ask any?

THE CHAIRMAN: Pardon?

MR. FENERTY: I thought there was somebody else going to cross-examine.

MR. S. B. SMITH: I have some.

MR. FENERTY: Are they all finished?

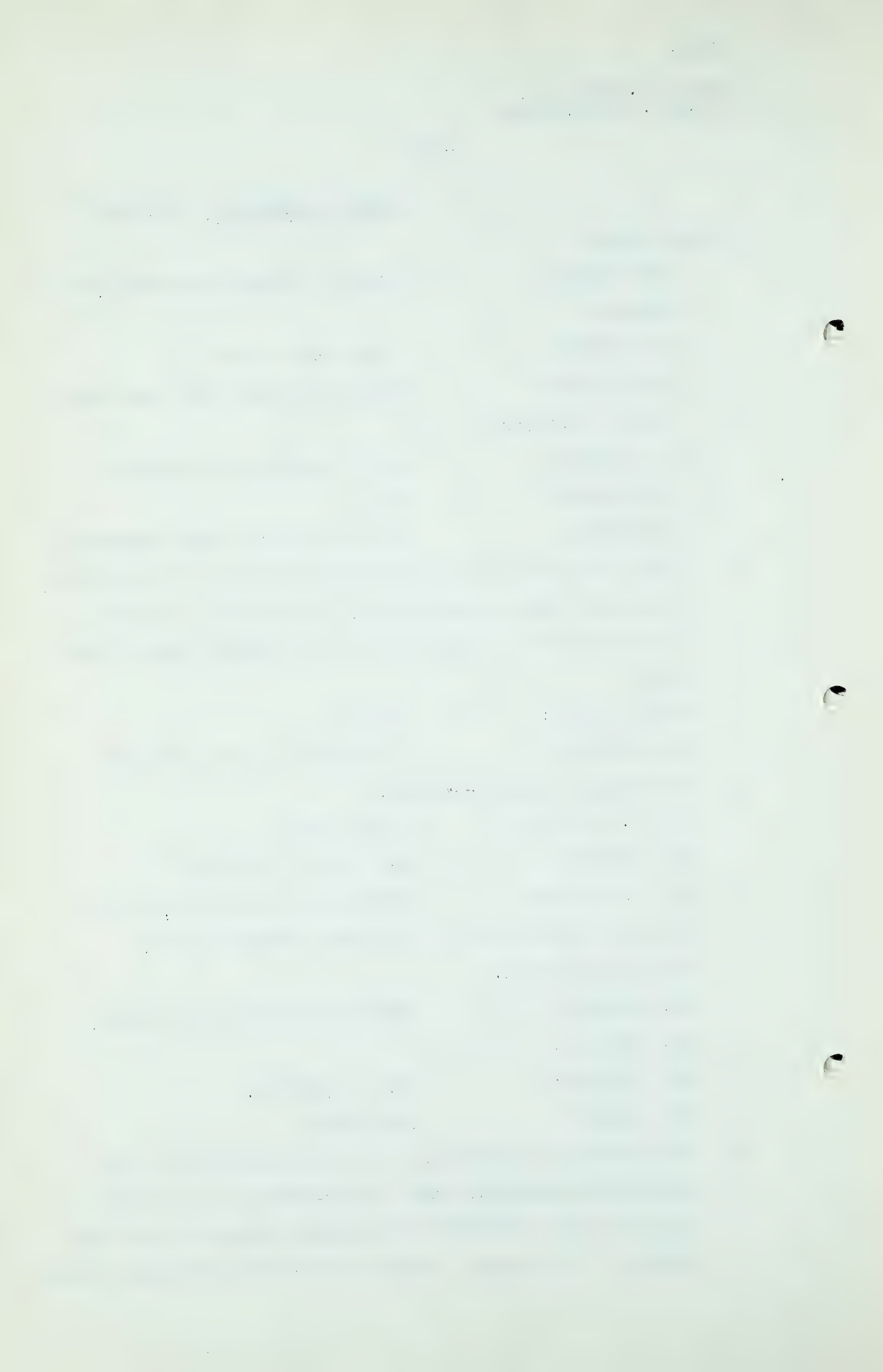
MR. S. B. SMITH: I have a few questions, and I had not opened at all. I am quite content for Mr. Fenerty to finish.

MR. FENERTY: Perhaps you had better finish, Mr. McDonald.

MR. McDONALD: No, you proceed.

MR. FENERTY: All right.

Q You realize, Mr. Hawthorn, at the conclusion of the examination yesterday that I was talking to you about pipe line gas available for internal consumption and for export? I had merely asked you to repeat the figures that



David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 315 -

you had given in the Table here of a total of 5 trillion, 614 billion, divided in the way you have in your Table. What I intended to do, and why I left it in the middle I do not know, was to ask you to apply to those figures the time element and the deliverability element. First of all, what is the time? Do I understand that that gas is available for a pipe line, 2 thousand 251, those are all in billions, are they?

MR. C. E. SMITH: 2 trillion and something.

Q MR. FENERTY: The Table immediately following Page 30, you have the marketable gas, gas not available or allocated, you see, and that is gas which can be recovered within twenty or thirty years, within twenty or thirty-year periods respectively?

A No, sir, we have made no over-all studies of deliverabilities of the whole group of fields and reserves.

Q You did not make details of it, but, first of all, you say that this figure of gas available for pipe line is available within twenty years, that is right?

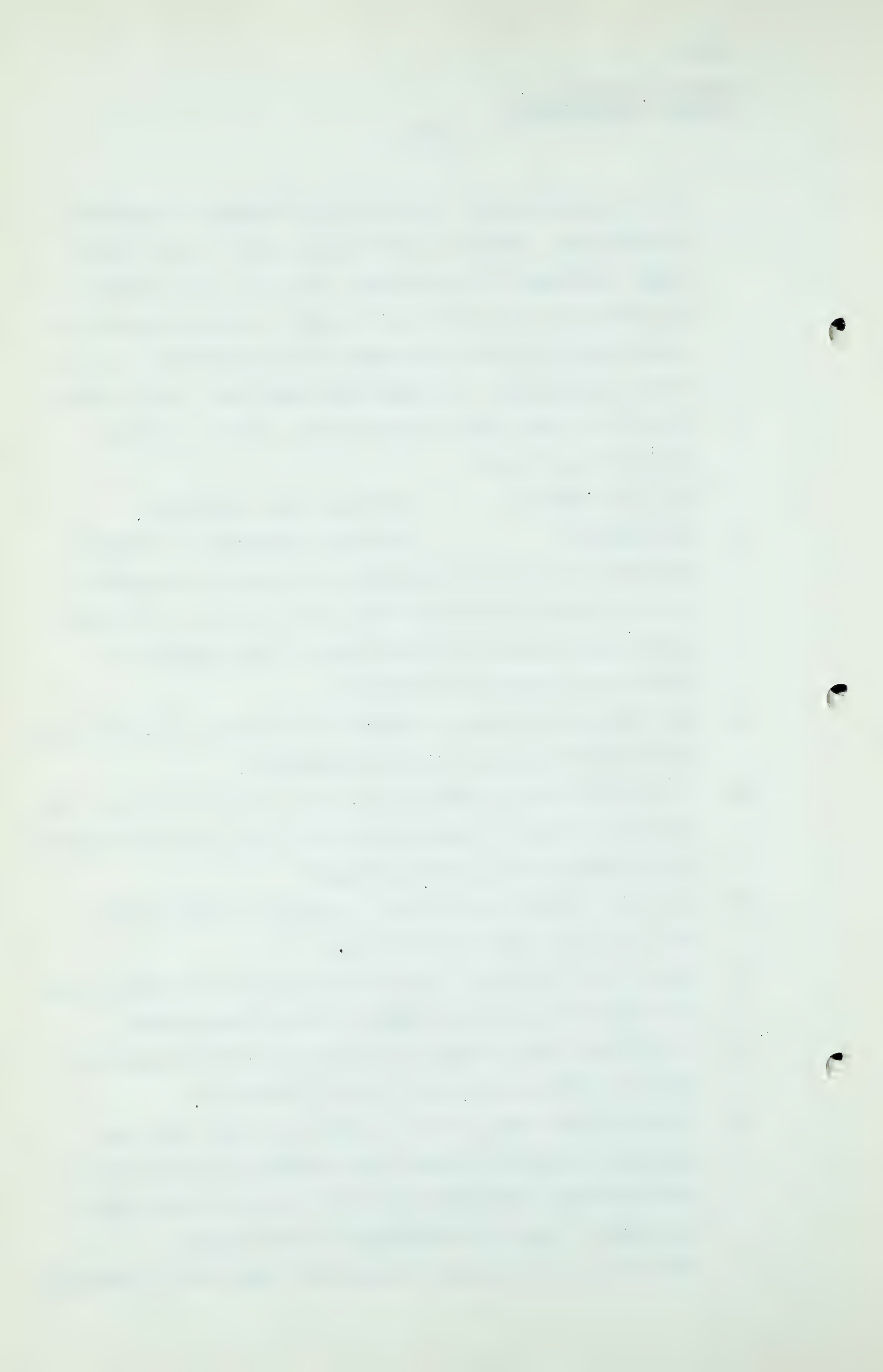
A No, sir, I would presume that it would or could not be all recovered within twenty years.

Q And do you think that the gas not available for pipeline is available for local consumption within thirty years?

A I would not like to express an opinion on that right now because I haven't made the over-all study of it.

Q I take it that some of this gas that you have said was available for pipe line and some gas which is also available for home consumption may not be available for sixty or seventy years, economically, is that right?

Q That is a possibility that some of it could not be recovered



David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 316 -

in that long a time. It is not probable.

Q Well, we have had trouble when we tried to bring it down to that, as we wanted it, then we were in trouble. Do you think those figures, if some is not available for sixty or seventy years, have very much to do with this Inquiry?

A Yes, sir, it has a lot to do with it.

Q I see. If I happen to be sitting in my house at 40 below zero and by reason of inability to deliver gas during that period, and I am cold, it would not help very much if the Company can give it to me next July, will it? Do you think it will keep my circulation up? You do not, do you?

A You are making the statement.

Q No, I am just wondering, and I am asking you. You see, I suspect it won't. I was just wondering what you think? Otherwise, what I am getting at, I gather, what I gather is that you have not had much experience yourself, and haven't had very much to do with gas in a climate such as this. Have you had experience before in a climate where you have got about 10,000 degree days?

A Yes, sir.

Q And in that case the deliverability was the main consideration, wasn't it? Wasn't it?

A The availability of the gas at that time.

Q The deliverability, I prefer that; it is a good word, isn't it?

A Yes.

Q Availability you think is the same thing?

A Yes.

David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 317 -

Q But you have not made a detailed study about that?

A That is what I said.

Q Pardon?

A That is what I said.

Q You are not very much concerned about local supplies, are you, just whether there is twenty years for financing for a pipe line, is that really your attitude before this Board? That conclusion follows, doesn't it, that as far as you are concerned that is it, isn't that right?

A Well, we have made certain statements there.

Q I know, but is that your attitude? There is the question. If you do not want to answer it we will pass on to something else?

A Do you mean if I have any concern for the interests of the Province in delivering the gas?

Q You have not made any study of it, have you?

A That is what I said.

Q And if you had been interested as far as this inquiry was concerned, I presume you would have made a study of it?

A Not necessarily.

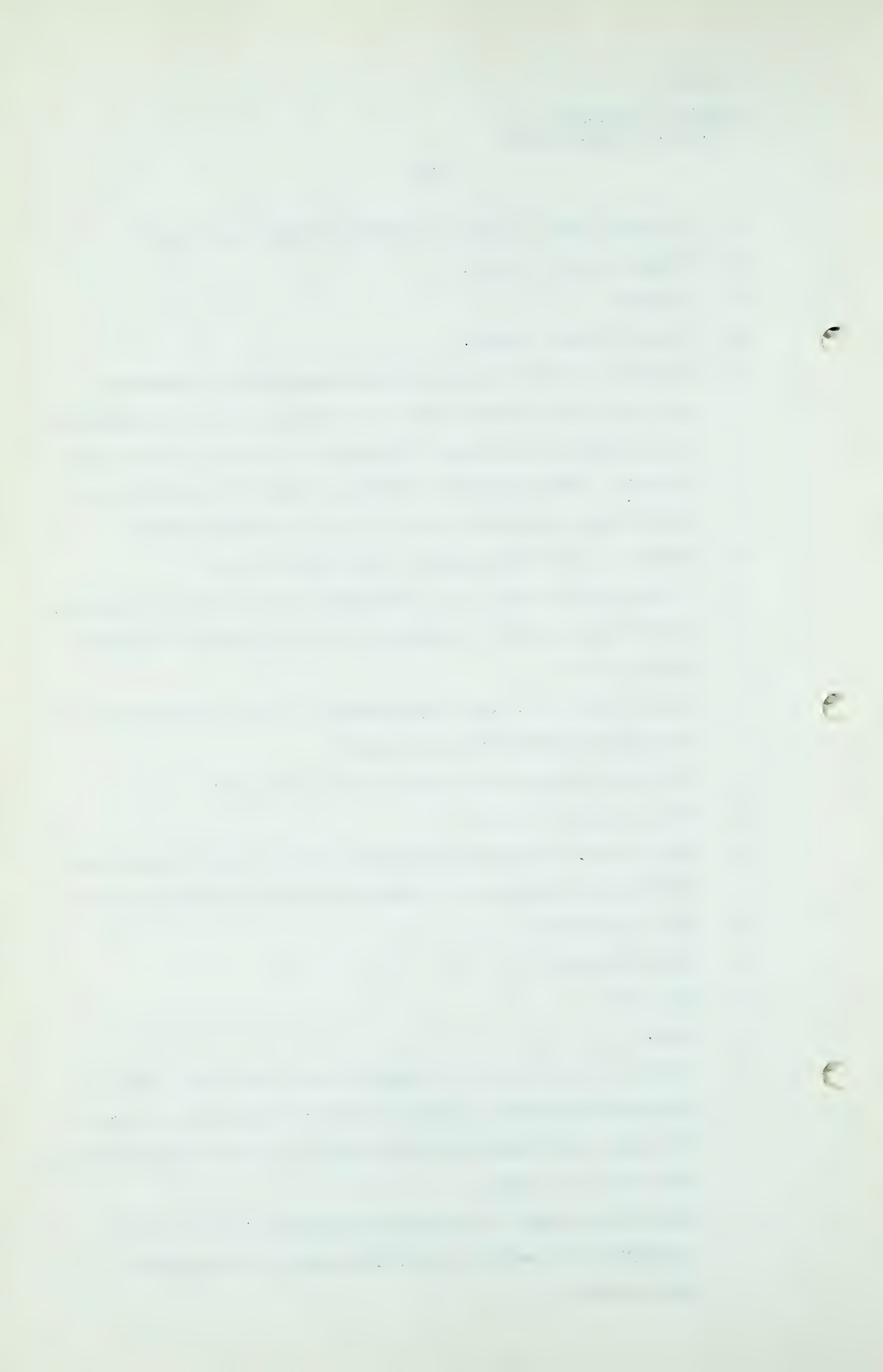
Q You would not?

A No, sir.

Q I see.

A Because we know of the volumes of gas, and there will be delivered reasonable quantities over a reasonable number of years, and towards the depletion of it the deliverabilities will be timed.

Q And did you make any study of deliverability for local consumption as well as otherwise when you recommend a grid system?



David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 318 -

A No, sir.

Q Do you think it has anything to do with it?

A Yes, sir.

Q But you recommended that without making any study of it?

A We made the statement as to the apparent efficiency in gathering and economics in gathering of a grid system, that is right.

Q Yes, I see. All right. Without reference to local conditions?

A Without reference to the over-all deliverability problem, that is right.

Q Well, well, I wonder if I should cross-examine you any further? I think I will anyhow. Now, we have learned this, haven't we, that from these areas which, for convenience we will say are allocated to Canadian Western, I am speaking of Jumping Pound and Turner Valley, Foremost and Bow Island, we can foresee peak load requirements for about eight, nine, or ten years ahead, I think you have told us that?

A Mr. Lewis subscribed to it.

Q But will you also subscribe to that figure?

A Yes, I think that sounds like a reasonable figure.

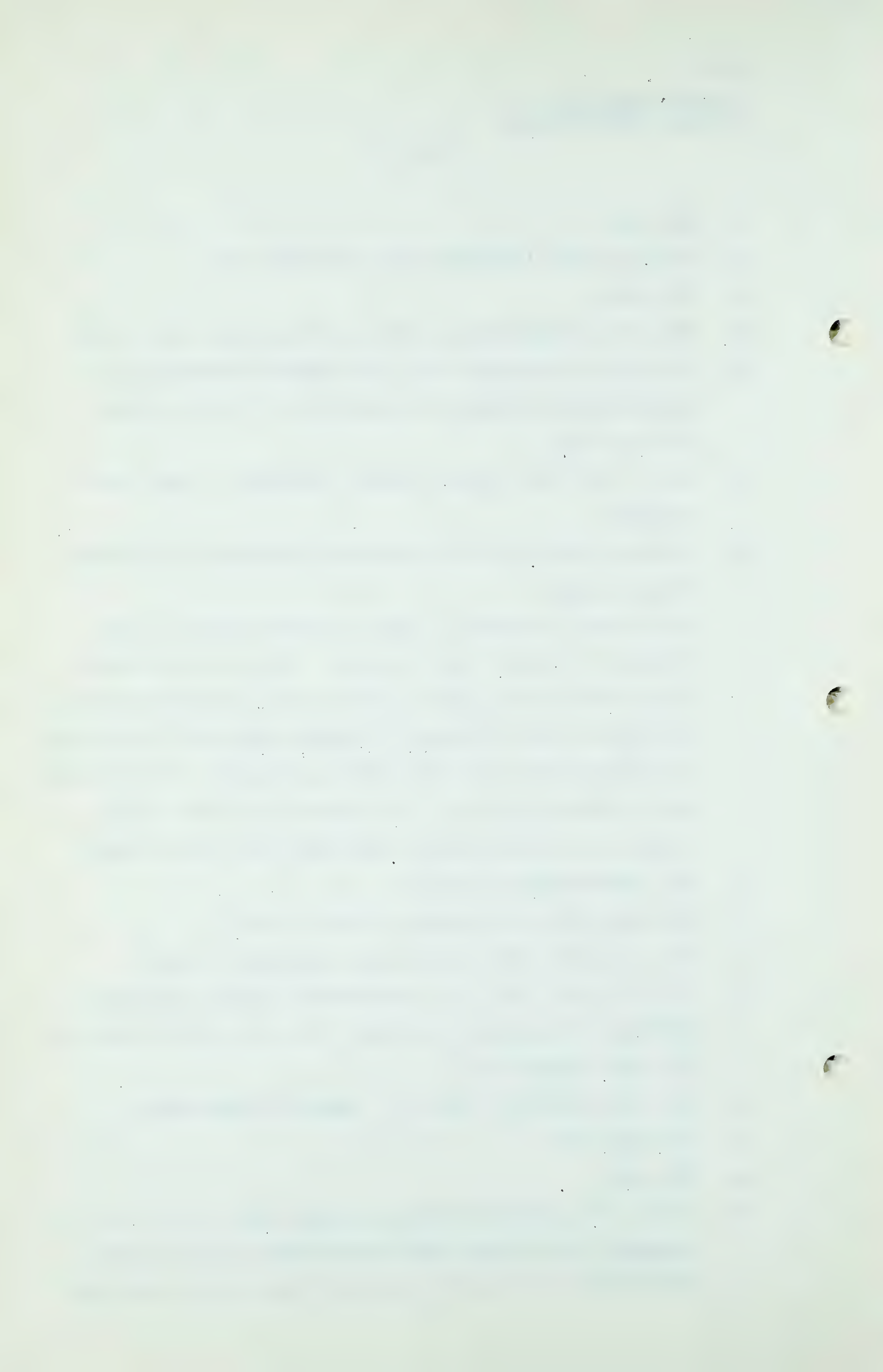
Q Do you foresee peak load requirements perhaps adjacent to Edmonton for perhaps that long? I do not know whether you had that figured out?

A No, sir, I made no study of Edmonton requirements.

Q You have not?

A No, sir.

Q I see. Now, without taking too much time, it all ties in together, but I would like to get this, we had a little discussion the other day about the value of oil well gas



David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 319 -

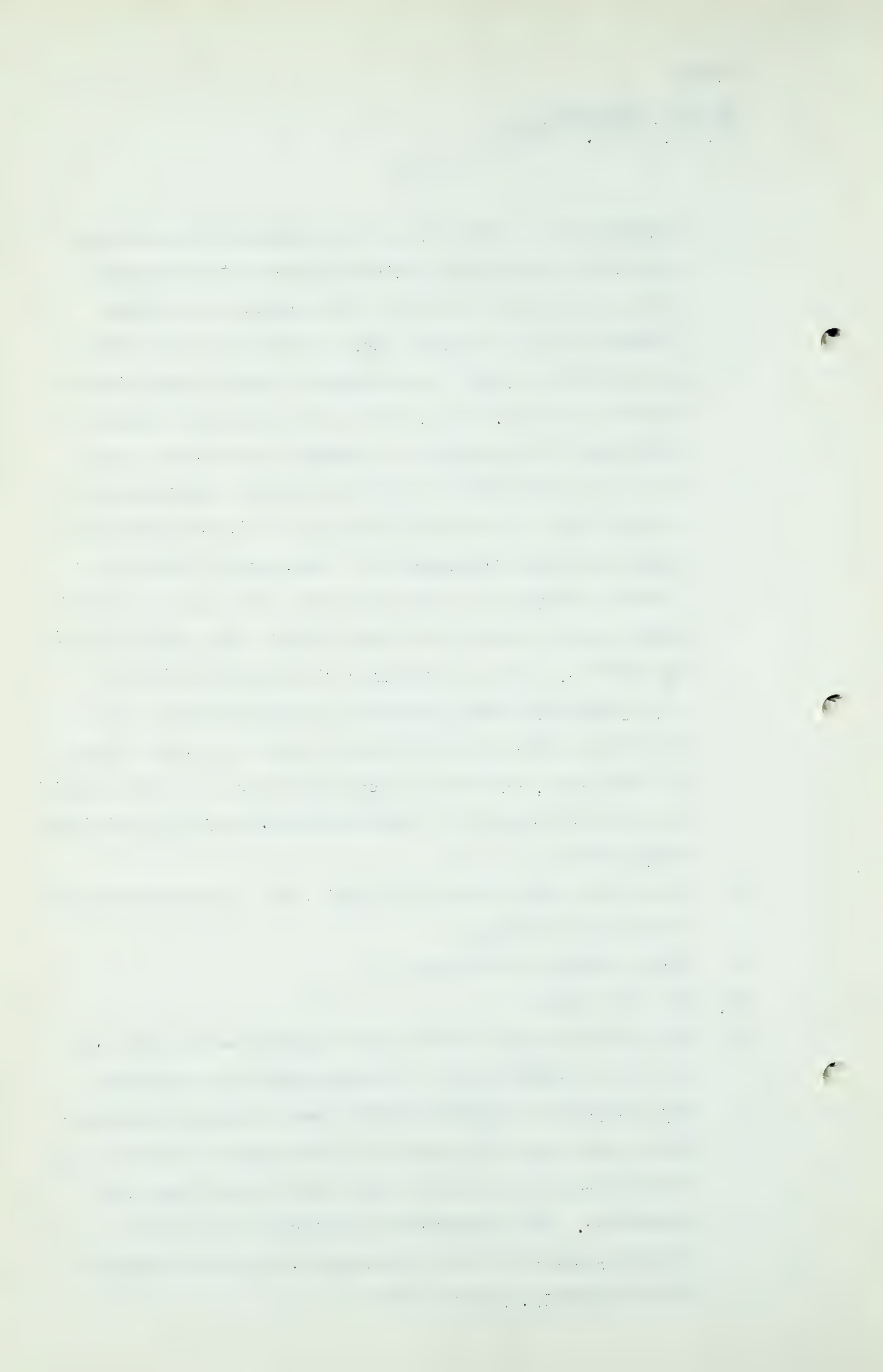
particularly to Alberta, and you explained to me why you referred to particularly Alberta because the pressures were not as high necessarily for export, not as high necessarily as for export, that we can get it in low gathering lines, and I did suggest, I do not know whether it was you or Mr. Lewis, that there would be a serious curtailment of oil well gas because in the winter time, or, I mean, that there would be a serious curtailment of oil well gas in the winter time, and I do not think that suggestion met with approval. Now, are you familiar - I want to follow that along because I am anxious to know where you are going to get your gas for the grid system in the winter. Are you familiar with the provisions of our legislation which provides for production from any pool being shared by the owners of that pool, the areas in that pool, and that the production from all pools being prorated as required in this Province. Do you know anything about that?

A I have not read the Act in detail, but I presume that those provisions are there.

Q Well, presume it to be so?

A Yes, all right.

Q And in your report and the other reports we have had, we have had intimation that oil development is continuing and will not be hampered by this lack of market for gas, we are all expecting further oil development; that is one reason why we are going to have more oil well gas, you remember. Now, picture the situation if we have a further expansion of oil industry, and we are having it quite rapidly, you know that?



David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 320 -

A Yes.

Q You perhaps know that at the moment, pending completion of a pipe line, we have not got all the markets we want for oil. You knew that, didn't you?

A Repeat that question, will you?

Q I say, pending completion of the pipe line to the head of the Lakes, we haven't got all the markets we want for our available oil?

A That is right, yes.

Q Yes?

A That is the purpose of the line.

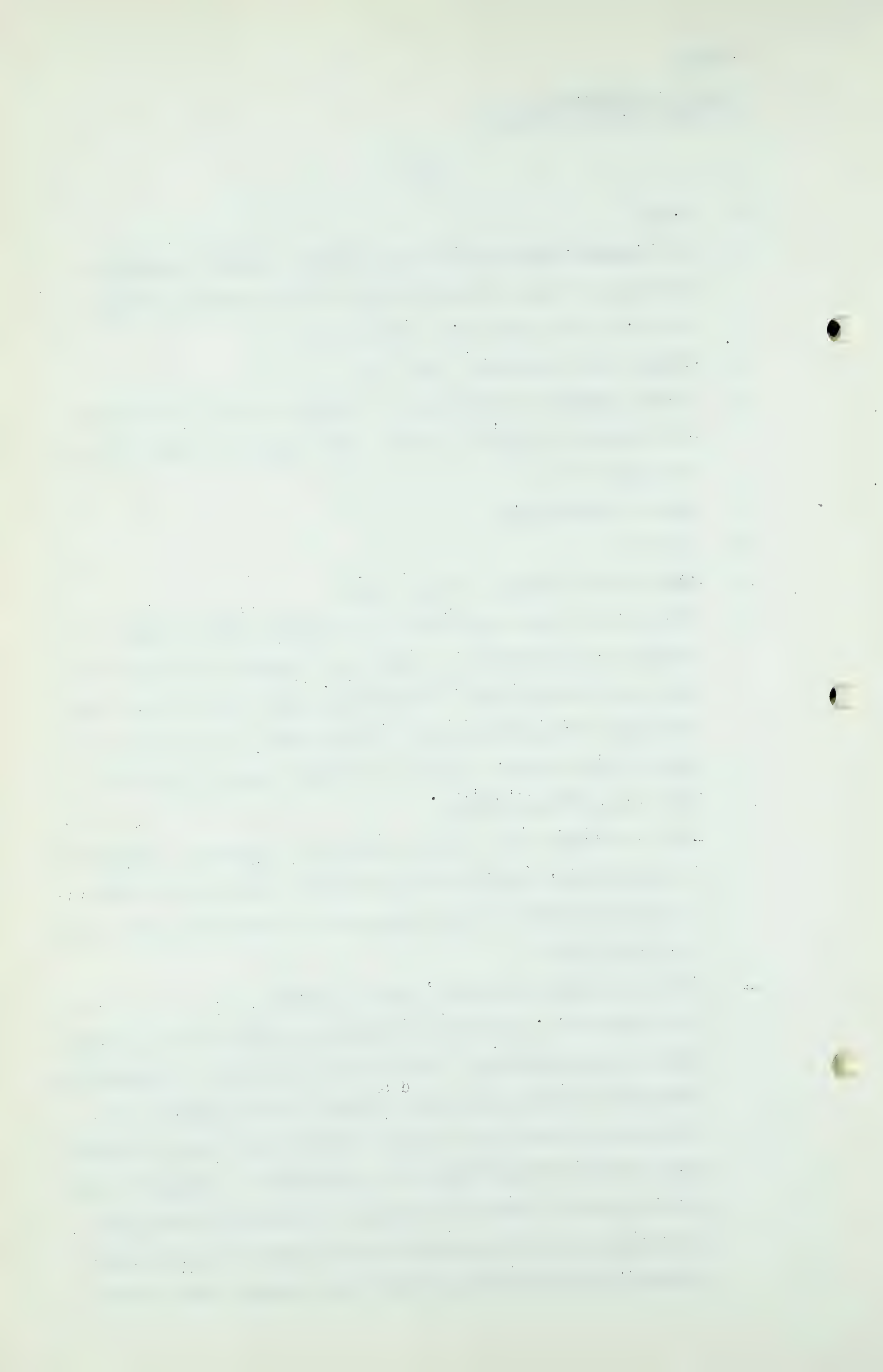
Q Now, I want you to picture the situation when we have a greater oil production, and we are sending it through this pipe line to the head of the Lakes, and I take it you did know that navigation ceases on the Lakes in the winter for five or six months, I think, I am not sure of the time?

A That is my understanding.

Q And it follows that you are going to, unless you can store it some place, you are going to have a great curtailment of oil production in the winter here because we cannot ship it, aren't we?

A If that is the situation, that is right.

Q Just assume it. I believe we might as well face it. Assume that is the situation, and you have got your oil production throughout Alberta prorated amongst all the owners, you see, and you have got no market except this limited market that we have had with this big production, I suggest to you that it is well within the range of possibility that the curtailment of oil production in the winter in each well, involving proration amongst all well owners, will require



David G. Hawthorn,
Cr. Ex. by Mr. Fenerty

- 321 -

the use of the gas produced with that limited production for field operation. Can you picture that?

A Yes, sir, if that situation occurs.

Q Yes. And that takes your oil well gas out of the picture during the period you need it, during the winter?

A If that situation occurs, yes.

Q If that situation occurs?

A Yes.

Q Except for the period that we do not want it, is that right?

A That is a correct analysis if that situation occurs.

Q All right. Now, assuming that is correct, and having that in front of you, I want you to tell me, if you can, several things. I think you will agree with me, won't you, that in this climate availability is the great thing we have to look out for?

A Deliverability is a very important thing up here with the wide fluctuations.

Q We have got to have gas, we have got to have it, but deliverability of the gas is the last test. That is the thing we have to worry about. We have got to have it when we want it, and at the time we want it, that is what we want, isn't that right?

A Deliverability is an important item in the production of gas in Alberta.

Q All right, as long as we understand each other. Now, we have had before us Exhibit 65 of the Westcoast Company, an estimate of Northwest Utilities' peak load of 236 million cubic feet in 1960. Which estimate is that, do you remember, Mr. Martland?

MR. MARTLAND:

I do not remember.

David G. Hawthorn,
Cr.Ex.by Mr. Fenerty

- 322 -

Q MR.FENERTY:: Exhibit 65 gives the Canadian Western - we have 236 million cubic feet for Northwest Utilities for 1960, and we have 200 million cubic feet peak load demand, 1960 for Canadian Western, that is a total of 436 million cubic feet a day, and there is the possibility now of the way things are expanding that it will be considerably higher, but those are estimates made at that time. Now, I want you to take your deliverability formula of $1/10,000$ and according to our figures, to our figures to maintain that peak load, taken in 1960, reserves should amount to 436 million by 10,000, or 4 billion, 360 million, or is it, yes, 4,630 billion cubic feet. That is the way it works out, doesn't it?

A Yes.

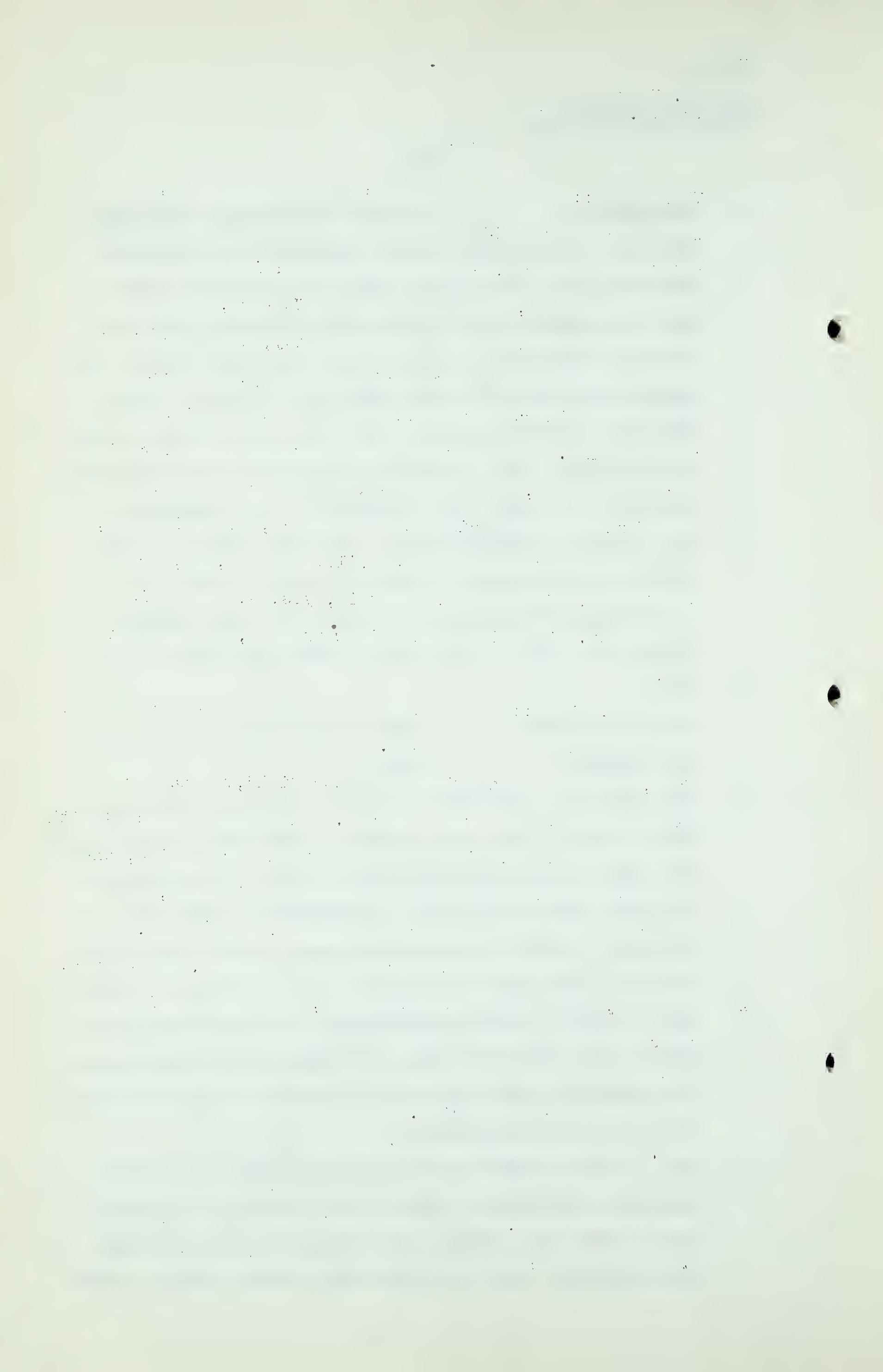
MR. C. E. SMITH:: That is 4,360 billion cubic feet?

MR. FENERTY: Yes.

Q Then, when you deal with the Leduc field, you have got to make - that is just gas in place. Then when you deal with the Leduc field, taking the uses for oil production, and all those other things that are included in that, you are going to have a larger requirement, aren't you, or is that all taken into consideration in the $1/10,000$ formula.

A The $10,000/1$ formula, Mr.Fenerty, is on the basis of an average throughout the year, or ^arough rule of thumb method for determining what reserves you might be able to deliver over a twenty-year period.

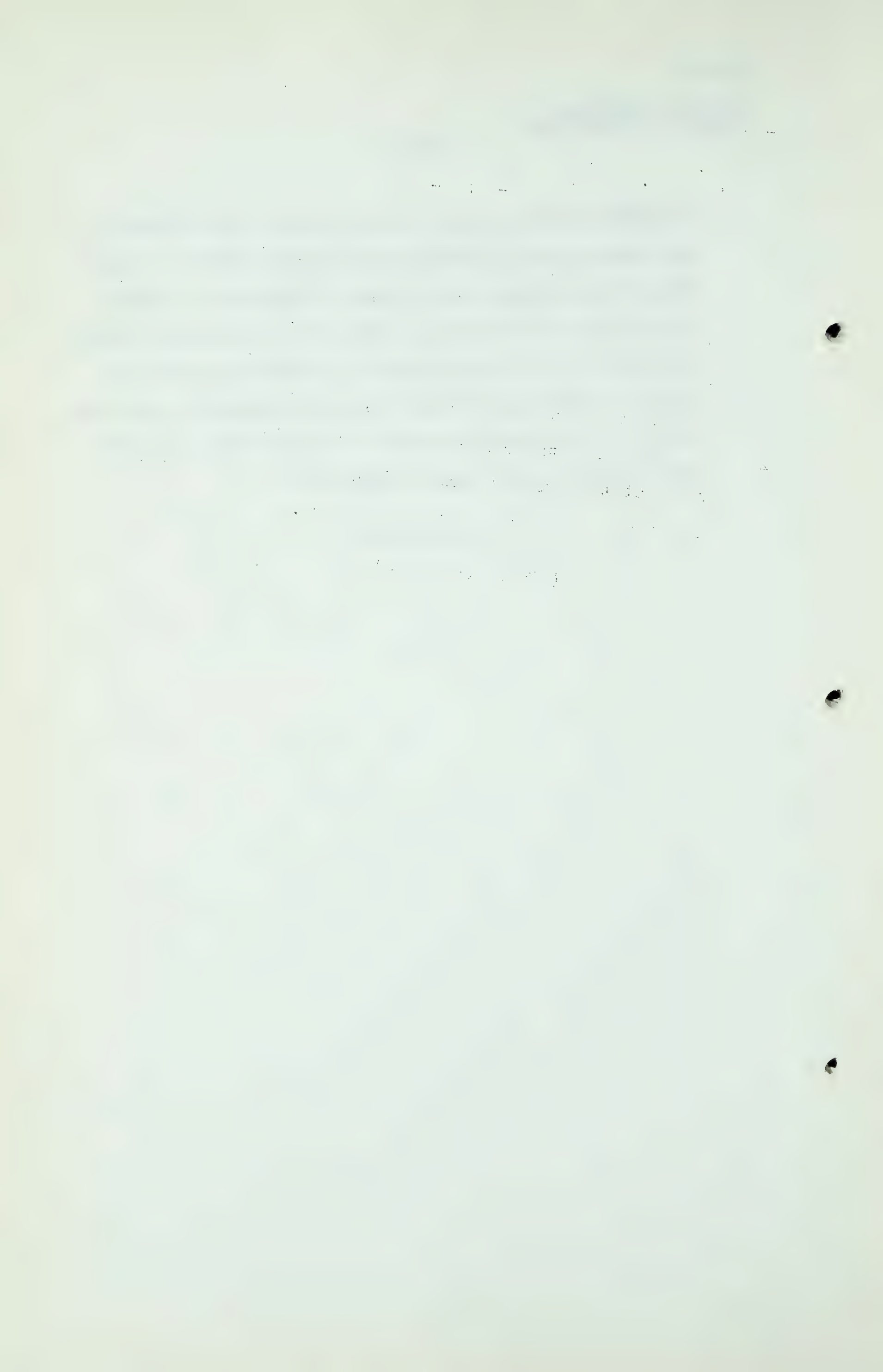
Q Yes. With the peak conditions here, such as the peak conditions applying to Leduc, it is difficult to use all the oil well gas, perhaps not during the period of pipe line operation, but it follows that you are going to have



a large reserve, a much larger reserve, aren't you, if you average your deliverability, or am I wrong in that? What I am talking about is, that you have got to have a much larger reserve than we have been talking about here to maintain that deliverability, doesn't that follow?

A I think that the reserves that are dedicated to the Province at the present time will or can be made to have deliverability for a great many years.

(Go to Page 324)



D. G. Hawthorn,
Cr. Ex. by Mr. Fenerty.

- 324 -

Q Yes, and we know why.

A The drilling of an adequate number of wells with proper provision for it.

Q And at a price for more years?

A That is correct, it all costs money.

Q If you paid \$10.00 a thousand for gas you might even get a trickle out for 60 years?

A Yes.

Q But it would not be of much use, in fact. But I get it. Now, will you consider the gas in Jumping Pound and Pincher Creek and the deductions that have to be made? I am going to read this to you. I want to put it on the record and if it is something you have to think about you can do it. In the case of Pincher Creek and Jumping Pound deductions have to be made for the use of a storage area such as Bow Island and Turner Valley which might amount to 80 million cubic feet a day, leaving 120 million cubic feet a day of peak demand. When consideration is given to the hydrogen sulphide carbon dioxide light fractions and fuel required to remove these impurities, as well as gathering lines and wells in cold weather some 30% is lost. Therefore, 120 million cubic feet a day a day represents 70% and the fraction 120 over 70 equals 171 million cubic feet a day of raw gas. The 1 over 10,000 formula would require, in the year 1960, and in increasing amounts in future years of 170 million multiplied by 10,000 or 1,710 billion cubic feet of gas in place reserves. I do not want you to check the validity of this for a moment, but will you think that over and see if that was the logical

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

•

$\frac{1}{2}$

D. G. Hawthorn,
Cr. Ex. by Mr. Fenerty.

- 325 -

conclusion?

A Those are your calculations?

Q I am asking you - I am not asking you to say at this moment whether they are correct, but will you do that later? I am asking you to think it over and see if that is the application of your 1 over 10,000 formula. Now if you are going to have a peak load shortage in both Calgary and Edmonton areas in say 9 or 10 years, you are going to have them pretty short at the same time because our temperatures correspond. Edmonton is a good deal colder but the temperatures do correspond. How is your grid system going to help the peak load problem in Calgary with shortages in both North and South, for your peak?

A I am not subscribing to your shortage in 9 or 10 years.

Q Well take it at 15 years. I don't care. Everybody, I think, admits you are going to have a shortage.

A Some time in the far distant future.

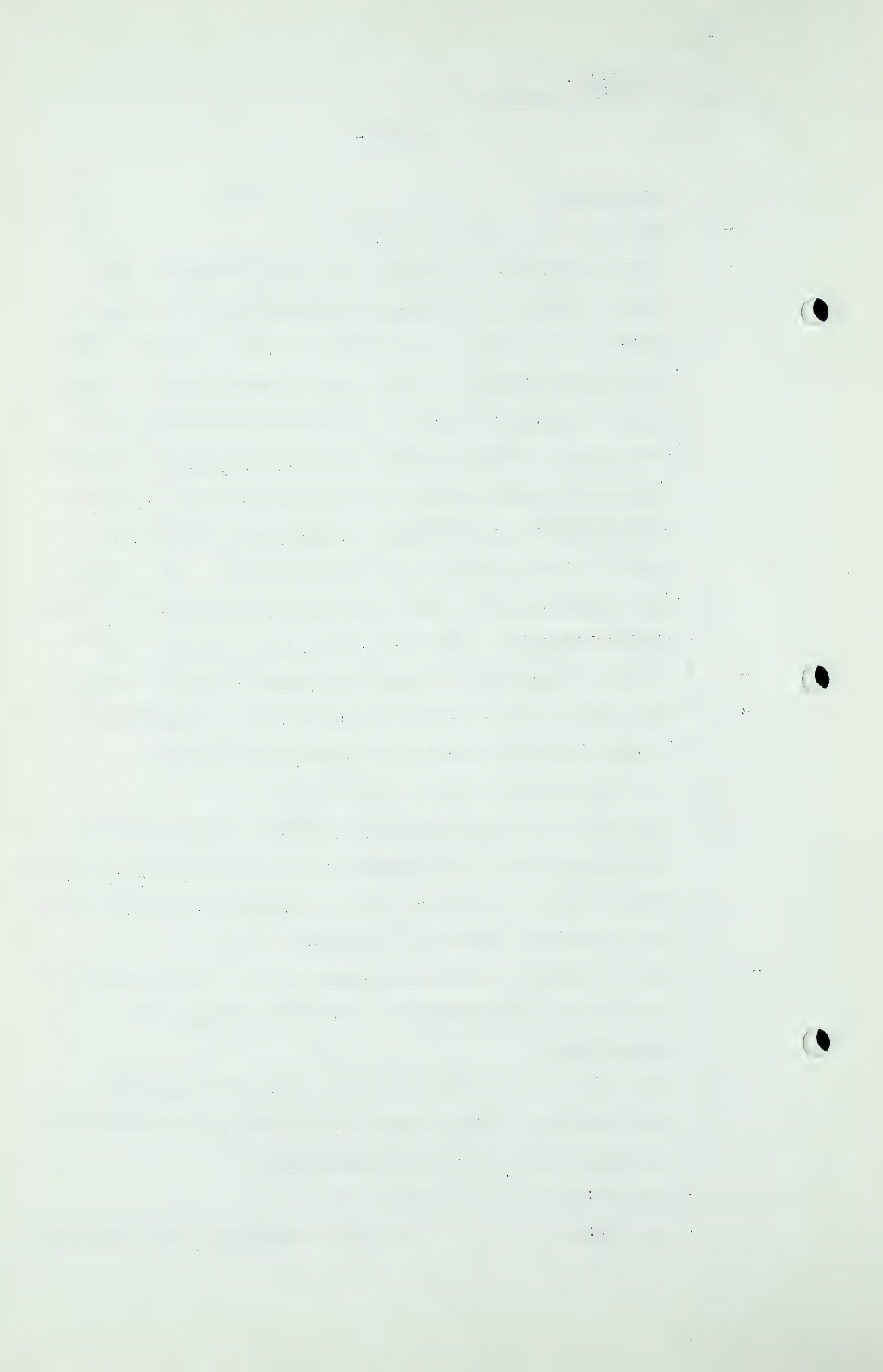
Q Certainly within the lifetime of some of those present there are going to be shortages. How is your grid going to help if you are going to have a shortage in both places at the same time? Have you any help for me?

A Yes. Your grid system will even out the availability of the reserves and distribute the whole set-up where it is needed most.

Q You are going to have shortages both north and south on the same days. That is going to extend to as high perhaps as 40 days on account of 21 below zero?

MR. MAHAFFY: Oh no.

MR. FENERTY: And it is going to wipe out your



D. G. Hawthorn,
Cr. Ex. by Mr. Fenerty.

- 326 -

storage. Where is your grid going to help you. I would like to hear about this. You have not any answer at the moment?

A Yes, I answered it before.

Q Well, it seemed totally inadequate, but all right, will you give it to me again?

A It evens out the reserves and makes them available where they are required.

Q Is not what you are saying that it evens out the shortages?

A No, I did not say that.

Q If there is a shortage in both places all you can do is to even out the shortages?

A You are assuming a shortage all through.

Q Assuming there are, then, shortages beyond the capacity of economic storage to cope with it all you do is even out the shortages?

A Well, it will even out the severity of the shortages. It might be that the shortage might be more severe in Calgary than it is in Edmonton and then it will even that out and help Calgary out.

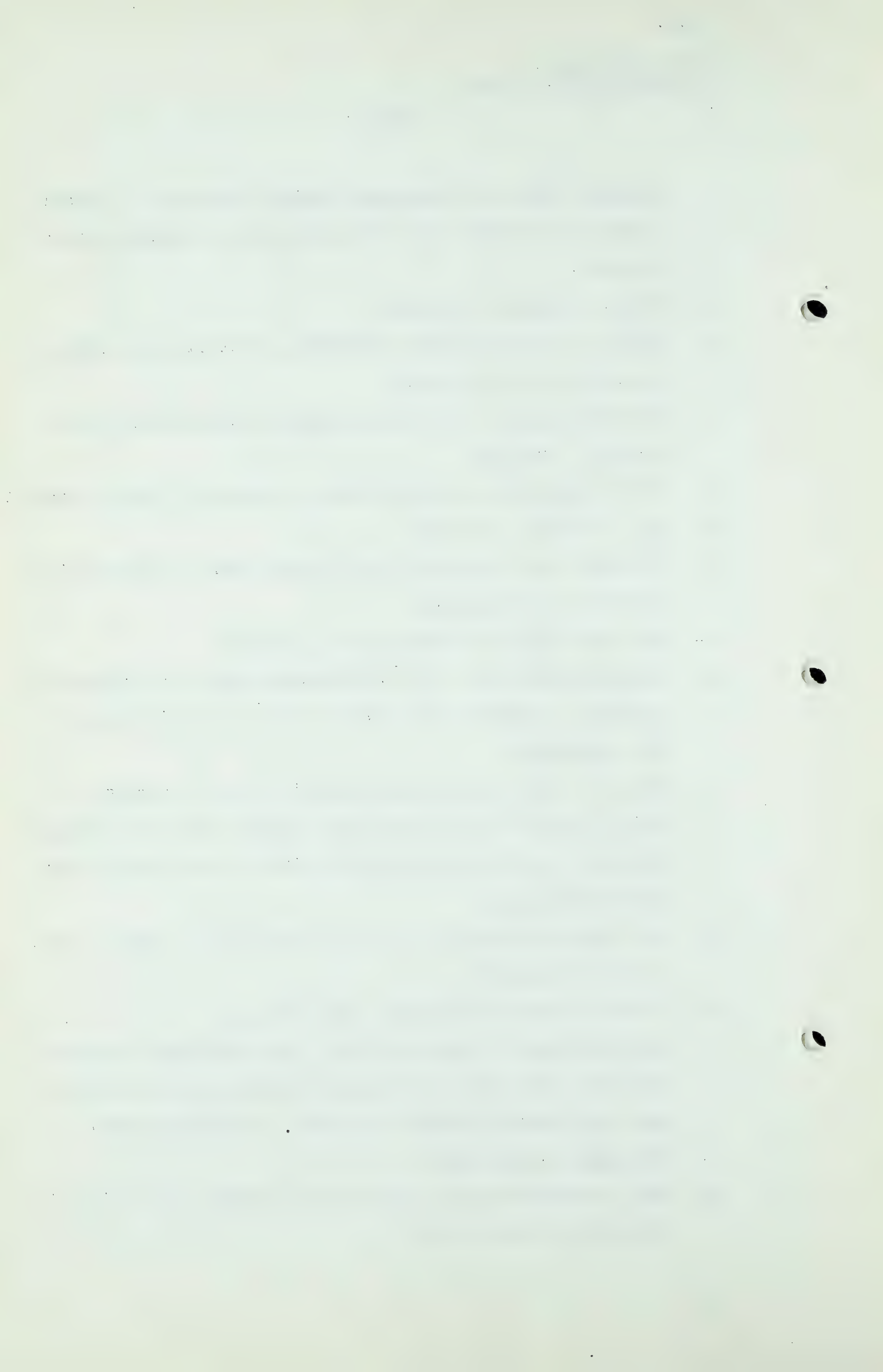
Q You think that might be of some help to us if that is the result of export?

A I think it would be a great deal of help.

Q If as a result of export we have these shortages you will at least even them out by a grid system and we will both feel the cold at the same time but in a less amount?

A You might be less cold.

Q That is about the best you can say for this proposition?
Well, that is all right.



D. G. Hawthorn,
Cr. Ex. by Mr. S. B. Smith.

- 327 -

CROSS-EXAMINATION BY MR. S. B. SMITH:

Q Mr. Hawthorn, do you seriously think there is any danger of either Edmonton or Calgary being cold on account of a shortage of gas? You do not, do you?

A I do know that they have run into times when there has been a shortage due to lack of delivery.

Q Yes. For instance, Edmonton had that situation when we had one small pipe line coming into the City which could not feed the gas into the city fast enough. Now they have three pipe lines and there is no difficulty in that regard now?

A That is right.

Q You do not envisage any shortage of gas for the cities of Edmonton and Calgary or in this province, do you?

A I do not. Not a serious shortage that would not be confronted by any other gas system. We have these mechanical break-downs in Oklahoma and Texas and our cities occasionally go short down there.

Q Mechanical breaks happen in any system, I suppose?

A That is right.

Q Now, Mr. Hawthorn, in your brief at page 21, is that part of your submission or Mr. Lewis'? You read this part?

A Yes.

Q I just want to ask you about the last line in the long paragraph in the middle of a page. You are talking about the Jumping Pound field and you refer to the average effective sand thickness of 147 feet. What sand are you talking about?

A I have used the word "sand" there and I meant the formation.



D. G. Hawthorn,
Cr. Ex. by Mr. S. B. Smith.

- 328 -

Q You are referring to the Madison limestone?

A The Madison limestone is correct.

Q I assumed that. Now, turning for a moment to the question of how much gas is available for export in this province, I take it you would be in disagreement with Colonel Baxter when he suggests there is no gas available for export at the present time.

MR. MARTLAND; He did not say that.

Q MR. S. B. SMITH: You heard what he said. You think there is gas available for export, don't you, over and above the needs for Alberta?

A I believe there is a surplus of gas over all the provincial requirements, yes.

Q And if Colonel Baxter meant that there was not then you are in disagreement? We all heard his evidence.

MR. C. E. SMITH: I thought he indicated there was no proof of it.

MR. MARTLAND: That is right.

Q MR. S. B. SMITH: Now you have too, as I understand your brief, in your view have to have proof of deliverable gas for export purposes to enable a pipe line for export purposes to be financed and constructed?

A That is correct.

Q And then I believe the effect of your evidence is that while you say there is 2.2 trillion cubic feet of gas available for an export pipe line, but approximately half of that is proven and half of that is probable, using those terms as they are used in your brief?

A I think we use the expression "probable," not more than half of which is proved.



D. G. Hawthorn,
Cr. Ex. by Mr. S. B. Smith.

- 329 -

Q Of the 2.2 trillion?

A That is correct.

Q Which you say is available for pipe line purposes?

A That is correct.

Q Now I think it was you who referred to the 37 years yesterday, or was that Mr. Lewis?

A I think I did, Mr. Smith.

Q Yes, I think you did. I am referring to the last paragraph on page 12 of the brief.

"The gas reserves now committed to market within Alberta are in excess of thirty years requirement." I think in answering Mr. Fenerty you made the computation and you said that reserves that had been more or less dedicated or contracted for the people of Alberta would in your view provide for 37 years?

A That is correct, dividing the figure 2 trillion 970 billion by the 70 billion cubic feet required in 60 years, gives a figure of 37 years.

Q Can you make this computation for me? If you projected that requirement to 50 years from 37, can you tell me how much gas would be required for the people of Alberta?

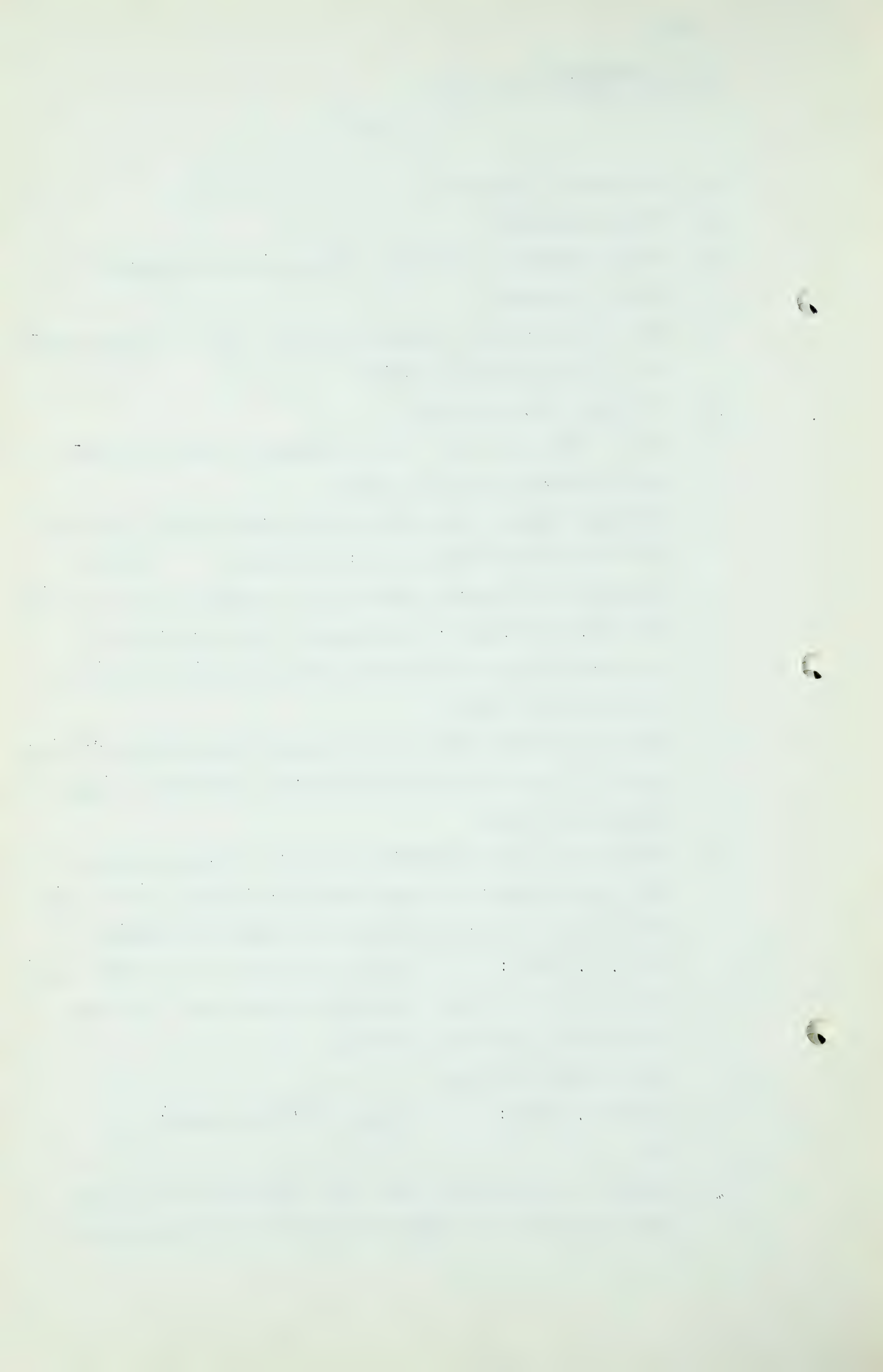
MR. C. E. SMITH: Now we have got one of these things at last. We have been three days without one. We used to have them every five minutes.

A About 4 trillion feet.

Q MR. S. B. SMITH: About 4 trillion feet?

A Yes.

Q Roughly 1 trillion more than the 2 trillion 970 billion that you say are required for provision for the people of



D. G. Hawthorn,
Cr. Ex. by Mr. S. B. Smith.

- 330 -

Alberta for 37 years?

A That is right.

Q So that would cut down somewhat, if that is to be the requirement for 50 years, that would be subject to discovery of other reserves and that would cut down somewhat your gas available for pipe line purposes, would it not?

A If you made the distribution that way, yes.

Q Your 2 trillion 251 billion which you class as available to pipe line, the bulk of that is Pincher Creek gas is it not?

A That is right.

Q Three-quarters of it is Pincher Creek gas roughly. 1248, I think, of that?

A That is right.

Q Southern Alberta you give 1 trillion 661 billion, and of that I think it is 1248 billion from Pincher Creek?

A It calculates out about 55%, Mr. Smith.

Q And if you project as we did the requirements of Alberta into 50 years, you are giving further insurance to the people of Alberta in a sense?

A I think that would be the logical conclusion, yes, sir.

Q And you are reducing or you are taking away from the proven and probable reserves what you have classed as being available for pipe line purposes?

A If you made that distribution that would be right.

Q And if you cut the gas designed for pipe line purposes to 1 trillion 250 billion, that is by 1 trillion, you would not have enough gas available for the purposes of Western Pipe Lines, would you?



D. G. Hawthorn,
Cr. Ex. by Mr. S. B. Smith.
Cr. Ex. by Mr. Macleod.

- 331 -

A I do not know for sure just what their requirements are going to be. But I do not believe that would be enough, no.

Q We can make these computations ourselves from the figures available?

A Yes.

Q MR. MACLEOD: You are familiar of course with the application in support of which you are giving evidence?

A Yes, sir.

Q And you know that that involves an application for a permit to export gas from the Manyberries field, the Pendant d'Oreille, Smith Coulee and Black Butte fields?

A Yes.

Q Dealt with in your report under the head of the Pakowki Area?

A Yes.

Q Do you know whether your applicant produces any gas in those fields?

A It is my understanding, just as Colonel Baxter stated, that his company has an interest, a working interest or some interest in Pincher Creek.

Q And Pincher Creek only. But I am referring to the fields that I have mentioned?

A I do not know of any others, except I have been informed that they have been interested in one well that has been recently drilled in the Taber area and that is the extent of my knowledge of their holdings.

Q According to your knowledge, then, they produce no oil in these areas I have mentioned, nor have they purchased

D. G. Hawthorn,

- 332 -

any, gas, rather?

A That is the extent of my knowledge of their holdings.

MR. MACLEOD: Mr. Chairman, may I make a statement which I think is relevant to our position?

THE CHAIRMAN: Yes.

MR. C. E. SMITH: Excuse me, I wonder if this is something that is subject to cross-examination. I drew your attention to a statement made some time ago by the Attorney General of British Columbia which was not subject to cross-examination, and some of the counsel were wondering about it. I am not criticizing one way or the other.

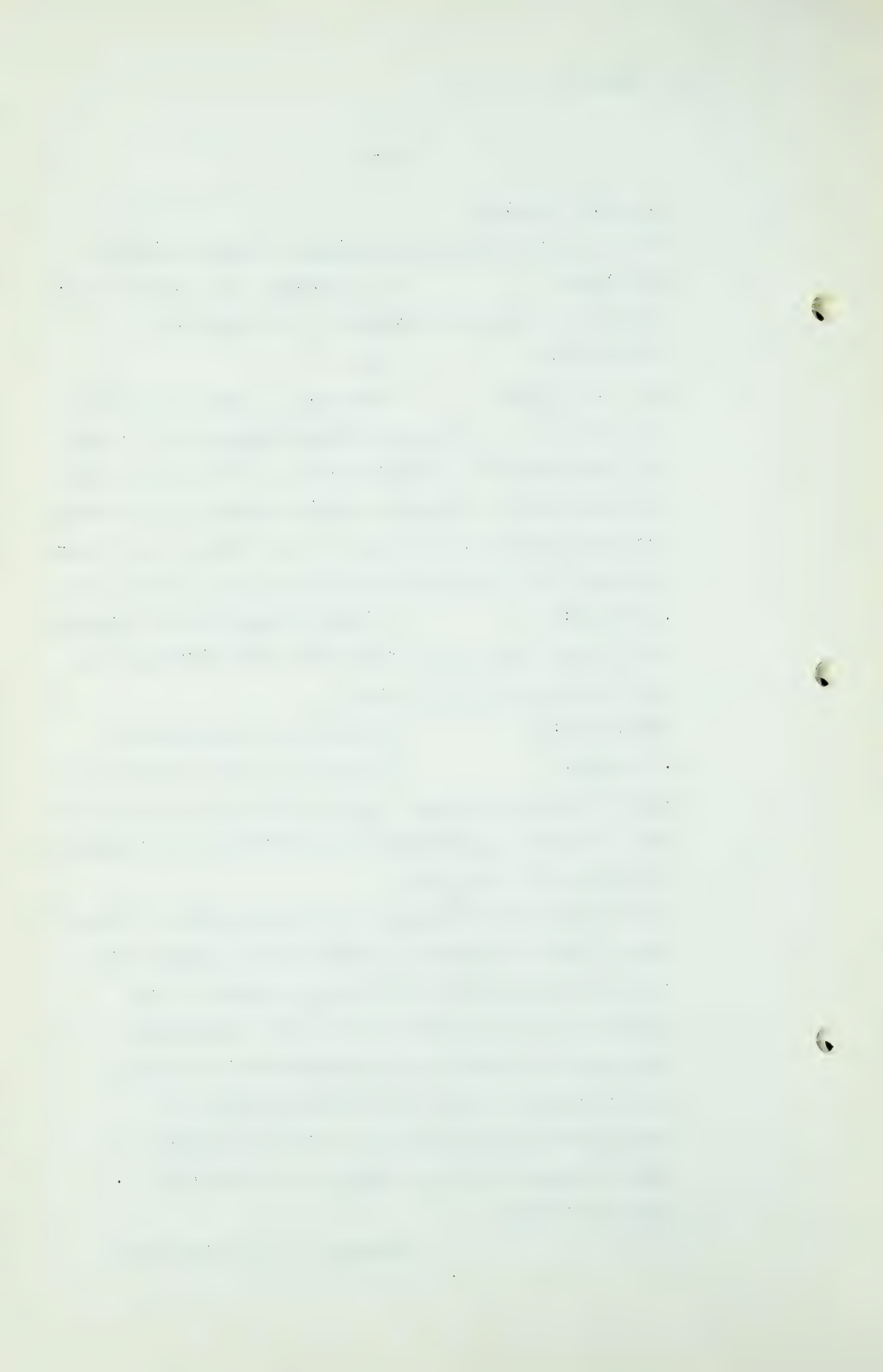
MR. FENERTY: I think we might put Mr. Macleod in the same class as the Honourable Gordon Wismer. He made a statement to the Court.

THE CHAIRMAN: We will hear the statement.

MR. MACLEOD: I am going to ask permission to make the statement anyway and my friends can say all they wish. This is the statement I am offering and I submit it is relevant at this stage.

Mr. Chairman and Gentlemen, with your permission I would like to make a statement on behalf of my clients which I think is relevant at this stage, inasmuch as the evidence so far adduced indicates that the present applicant is looking to the gas owned by my clients and in respect of which they have an application pending before your Board as a source of supply, in part at least, of the gas which it is asking for a permit to export.

Section 4 of the Act under



- 333 -

which this application is made, namely Chapter 2 of the Acts of Alberta, 1949 (second session) prescribes who may make an application under the Act. I quote the Section:

"4. Any person who produces, purchases or otherwise acquires or has entered into a contract to purchase or otherwise acquire property in gas within the Province and proposes to remove it, or cause it to be removed from the Province for use or consumption elsewhere than within the Province, shall make application to the Board for permission before doing so."

It is clear that the Section quoted not only specifies who may apply for a permit but also in respect of what gas the application may be made and it is to the latter point that my statement particularly refers.

There is no evidence so far adduced that the applicant is a person qualified to apply under the Act. This does not necessarily concern my clients, but they are concerned with the fact that the application is to export gas which they produce and own.

The present applicant does not produce natural gas in the Manyberries, Pendant d'Oreille, Black Butte or Smith Coulee fields referred to in Exhibit 6 on page 19, First Table and the map entitled "Pakowki Lake area", following page 22, pages 37 and 38 and the following table and graph and pages 39 and 40 and the following table and graph, nor has it purchased or

D. G. Hawthorn,

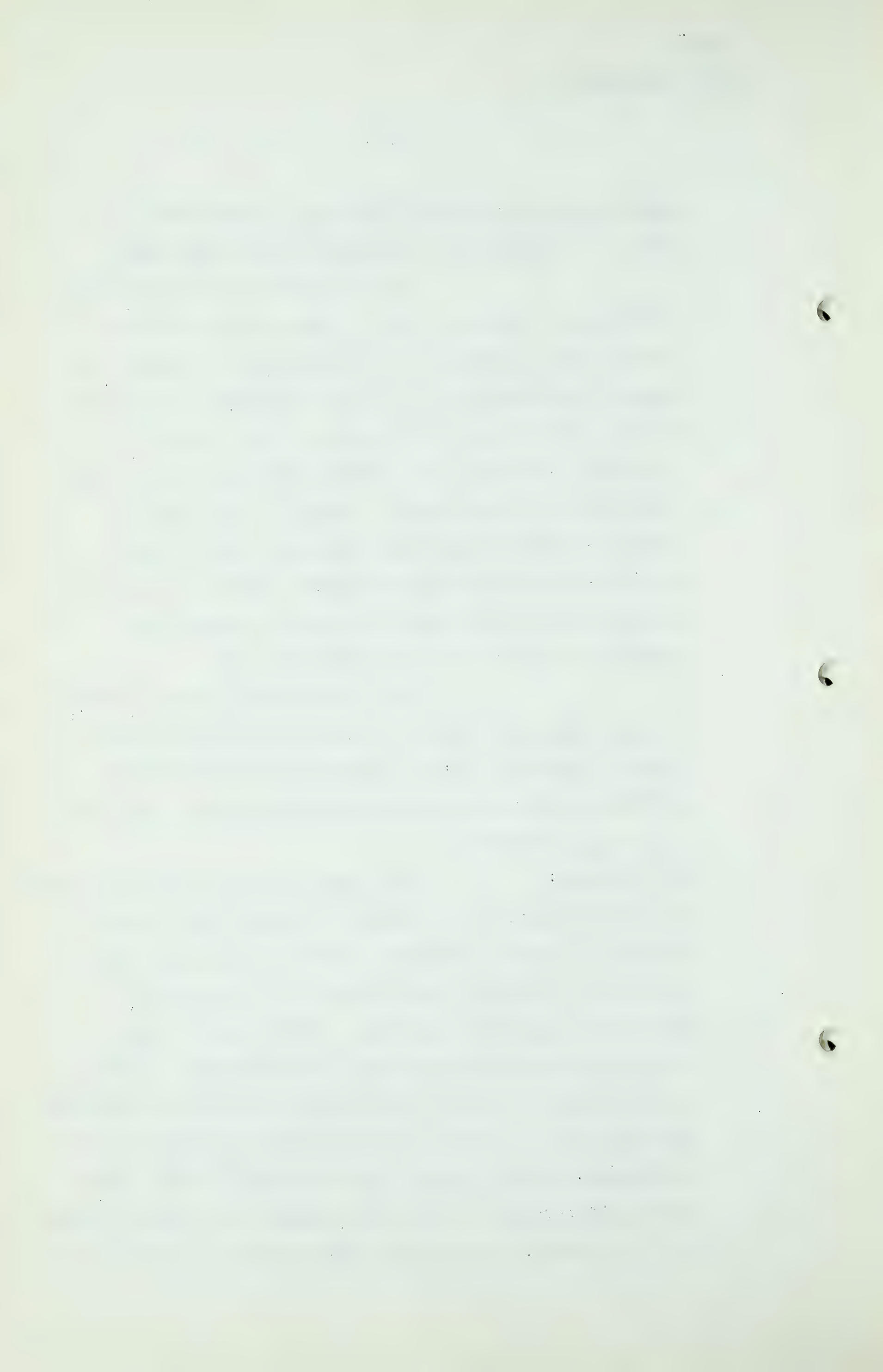
- 334 -

acquired the gas in these fields or entered into a contract to purchase or otherwise acquire such gas.

On the contrary my clients have produced all the proven gas in these fields and have entered into a contract with Montana Power Company, the largest distributor of gas in the neighbouring State of Montana, for the sale of this gas to that Company, or a subsidiary, to supply the needed additional reserves for distribution in that State. Naturally this sale is subject, as all transactions involving export of gas must be, to your Board deciding that there is a surplus of gas within the Province available for export and granting a permit for export under the Act.

In view of these facts I submit that the applicant should declare that its application does not affect my clients' fields or that the Board should rule that the applicant has no right to apply to export gas therefrom.

THE CHAIRMAN: This Board has asked all applicants to give information with respect to all of the fields. We want to know in detail the information on reserves, so that we can establish whether there is a surplus for Provincial requirements or not. Insofar as the matter of whether we permit that to be - if there is a surplus - to be exported, that is something we will have to determine later on. As far as the matter of asking applicants for information, we have asked them to supply us with information with respect to all known fields. So that in making this application, the present applicant has included all



- 335 -

of the known fields and reserves. I just want to make it clear that we have asked for this information in respect to all those fields, as far as reserves data are concerned.

MR. MARTLAND: I do not think I have anything to add to that, sir.

(At this stage there was a short adjournment.)

(Go to page 336.)

David G. Hawthorn,
Cr. Ex. by Mr. S.B. Smith.

- 336 -

MR. S.B. SMITH: I have another question or two before Mr. Hawthorn leaves the stand, if I may, sir, or do you wish to proceed?

MR. C.E. SMITH: Could I intervene for a moment?

MR. S.B. SMITH: Certainly.

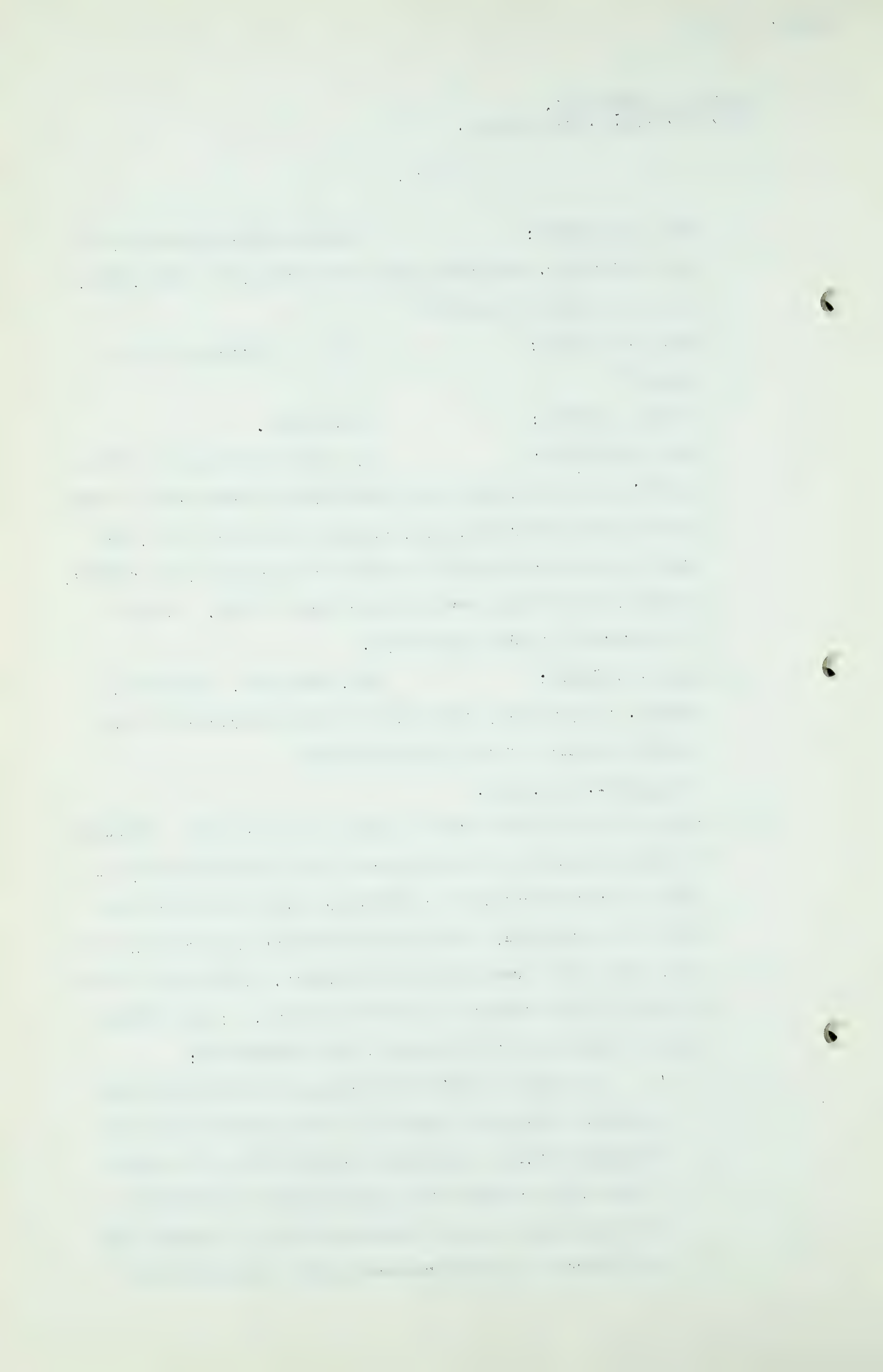
MR. C.E. SMITH: It has been brought to the Board's attention that in a preliminary transcript of what was said this morning, sir, and has been now typed, the date in the second last line should be "30th" not "13th". Probably all of you have noticed that by now. It will be corrected in the transcript.

Q MR. S.B. SMITH: Mr. Hawthorn, you would, I assume, be generally familiar with the provisions of the Natural Gas Act of the United States?

A In general, yes, sir.

Q And would you agree that this would be a correct statement of the principles of the Federal Power Commission applicable to certificates of convenience and necessity where there is a presently served market and an application for entry into that presently served market. Would you listen to this and see whether you agree with me. I am reading from a judgment of the Federal Power Commission:

" A market in which natural gas is already being served, within the meaning of the provision of the Natural Gas Act requiring a certificate of convenience and necessity for construction or operation of facilities for the transportation of natural gas to a market in which natural gas is already being



David G. Hawthorn,
Cr. Ex. by Mr. S.B. Smith.

- 337 -

"served by another natural gas company, does not mean only those communities in which there are presently existing physical facilities for the transportation and sale of natural gas, but the word "market" implies an area or territory of undefined extent bearing some reasonable relation to existing pipe lines and other facilities for the transportation and sale of natural gas; the word 'market' embraces that territory within which a natural gas company can economically render adequate service by reasonable extensions of its facilities, having due regard among other factors to the sufficiency of its available reserves of natural gas."

Would you agree that that is a statement, a good statement of the principles applicable in regard to entry into an area in the United States which is presently being served by a natural gas system?

A I think so. I think I will answer that "yes", to the extent that I can understand the language of the reading.

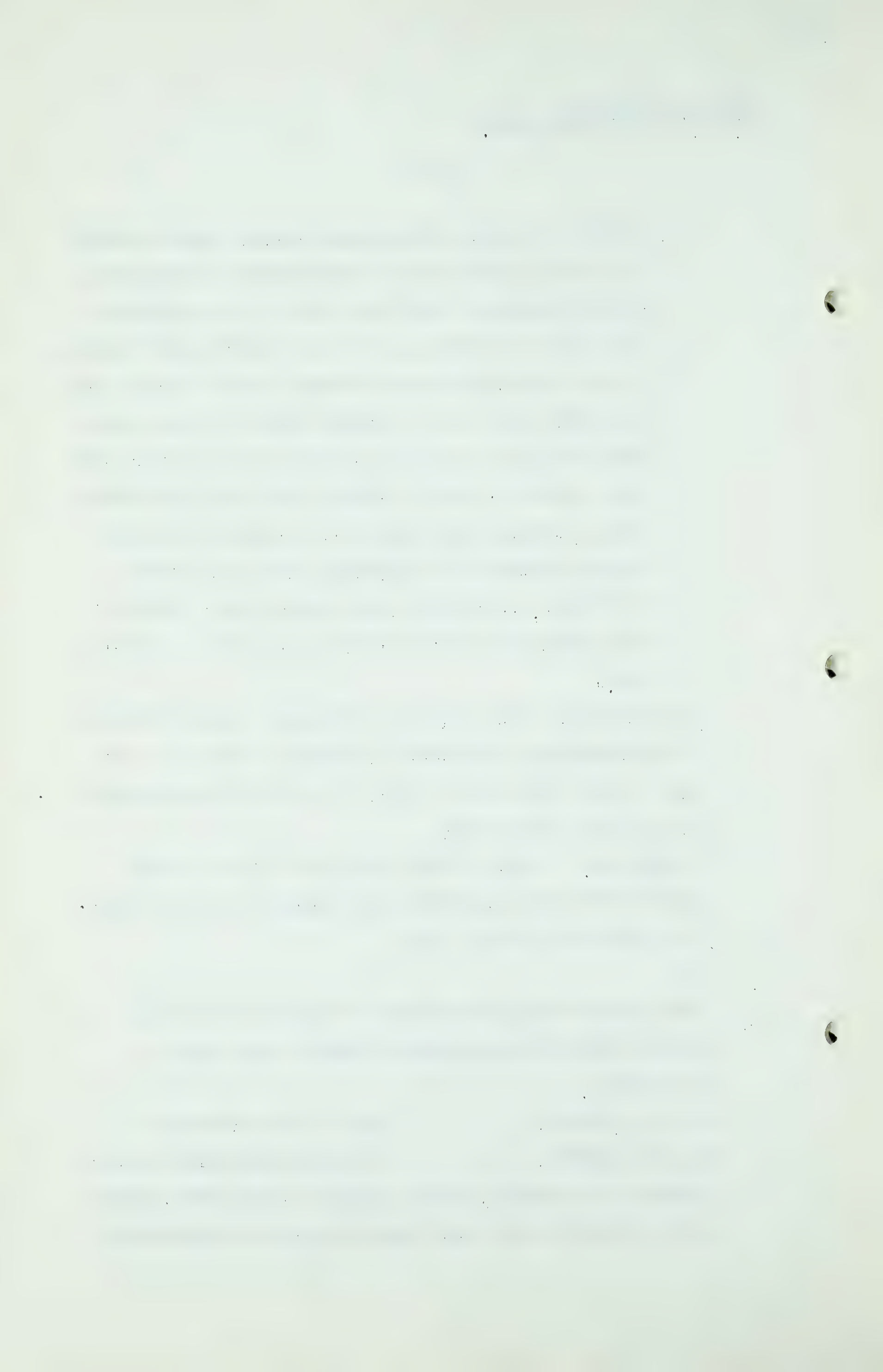
Q Do you want to look it over?

A Yes.

Q I am reading from the headnote of the decision of the Federal Power Commission and I think I have read it accurately.

MR. C.E. SMITH: What is the citation?

Q MR. S.B. SMITH: Re Kansas Pipe Line and Gas Company in 30 Public Utility Reports at page 321. Generally you would agree that that is a correct statement of



David G. Hawthorn,
Cr. Ex. by Mr. S.B. Smith.
Cr. Ex. by Mr. Mahaffy.

- 338 -

the principles?

A Yes.

Q Thank you.

CROSS-EXAMINATION BY MR. MAHAFFY:

Q Mr. Hawthorn, I believe you were present in this Hearing yesterday when I asked some questions of your associate, Mr. Lewis, concerning the possible operation of a grid system?

A I was.

Q And you heard the views which he expressed on that subject?

A I did.

Q Do you agree with the evidence which he was good enough to give me in connection with that point?

A Yes, I do, and I think the testimony that I have put in in regard to Mr. Fenerty's interrogations will support that.

Q Now, it seems clear from your evidence and the evidence of others that the problem of deliverability is a real problem, is it not?

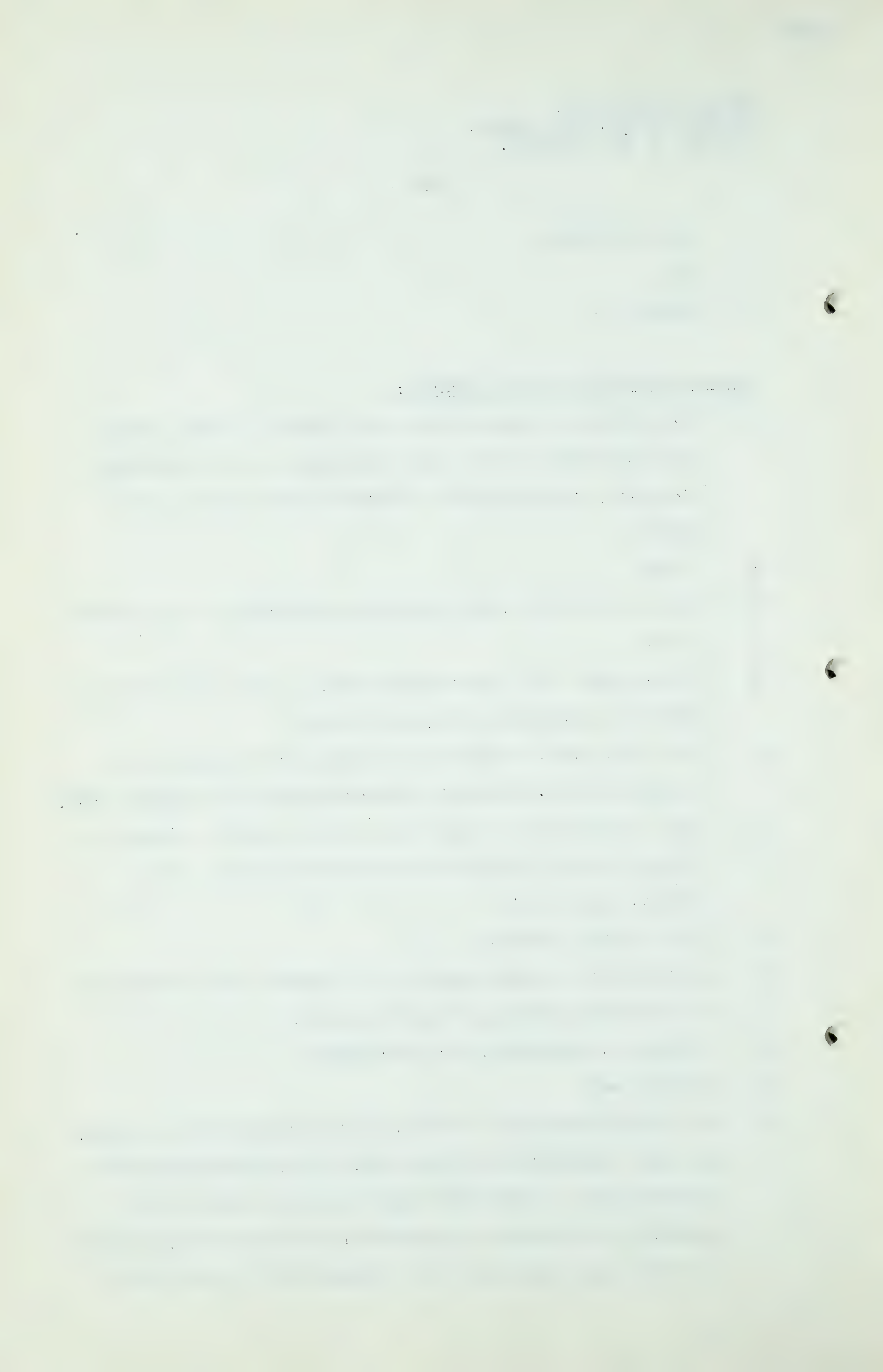
A It is a real problem.

Q And would the establishment of a suitable grid system help to solve the problem of deliverability?

A I think so, very much, very decidedly.

Q In what way?

A As I have described it before, by pooling all the reserves, all the transportation facilities, all the facilities for storing gas. I think that such a project would serve greatly to alleviate the problem of deliverability, smooth out the load, smooth out the availability of gas to the .



David G. Hawthorn,
Cr. Ex. by Mr. Mahaffy.
Cr. Ex. by Mr. D.P. McDonald.

- 339 -

consumers. If a situation arises like Mr. Fenerty suggests that there is an overall shortage every place, obviously the grid system can not cure that, all it can do is to even out the shortages and make the critical shortages less critical.

Q Yes. In other words, if I might say so, Mr. Fenerty was trying to take you one step beyond the line?

A Right.

Q In the suggestion that a grid system might possible make gas where no gas was available. You do not suggest that, do you?

A I do not suggest that, no, sir.

Q If there is a general shortage all over the Province, obviously a grid system can not remedy that, can it?

A That is right.

Q That is all, thank you.

CROSS-EXAMINATION BY MR. D.P. McDONALD:

Q Mr. Hawthorn, I would ask you to refer to Exhibit 7, that is, "Principles and Methods Used in Estimating Future Deliverabilities of Gas Wells".

A Yes, sir.

Q Page 9, the last line in the first paragraph:

"Any slopes that do not fall between $N = 1.0$ and

$N = 0.5$ are known to be in error."

Then you refer in the first part of the paragraph to the fact that the average is close to $N = 0.85$. Are you referring there to gas in single phase flowing under ideal conditions?

David G. Hawthorn,
Cr. Ex. by Mr. D.P. McDonald.

- 340 -

A Yes, sir.

Q Yes. And the reason for the difference between .5 and 1, I think Mr. Lewis explained, was the turbulent nature of the flow or some other characteristic?

A Yes, the turbulent nature of the flow can cause the slope of the curve to go beyond these limits, and at that time the subject is quite a highly technical one, but we have investigated it and there is endless literature on that subject, and we know and have come to know, I believe, that when the slope of the curve goes beyond 1 that the data are not reliable.

Q That is applicable to gas in single phase?

A That is right.

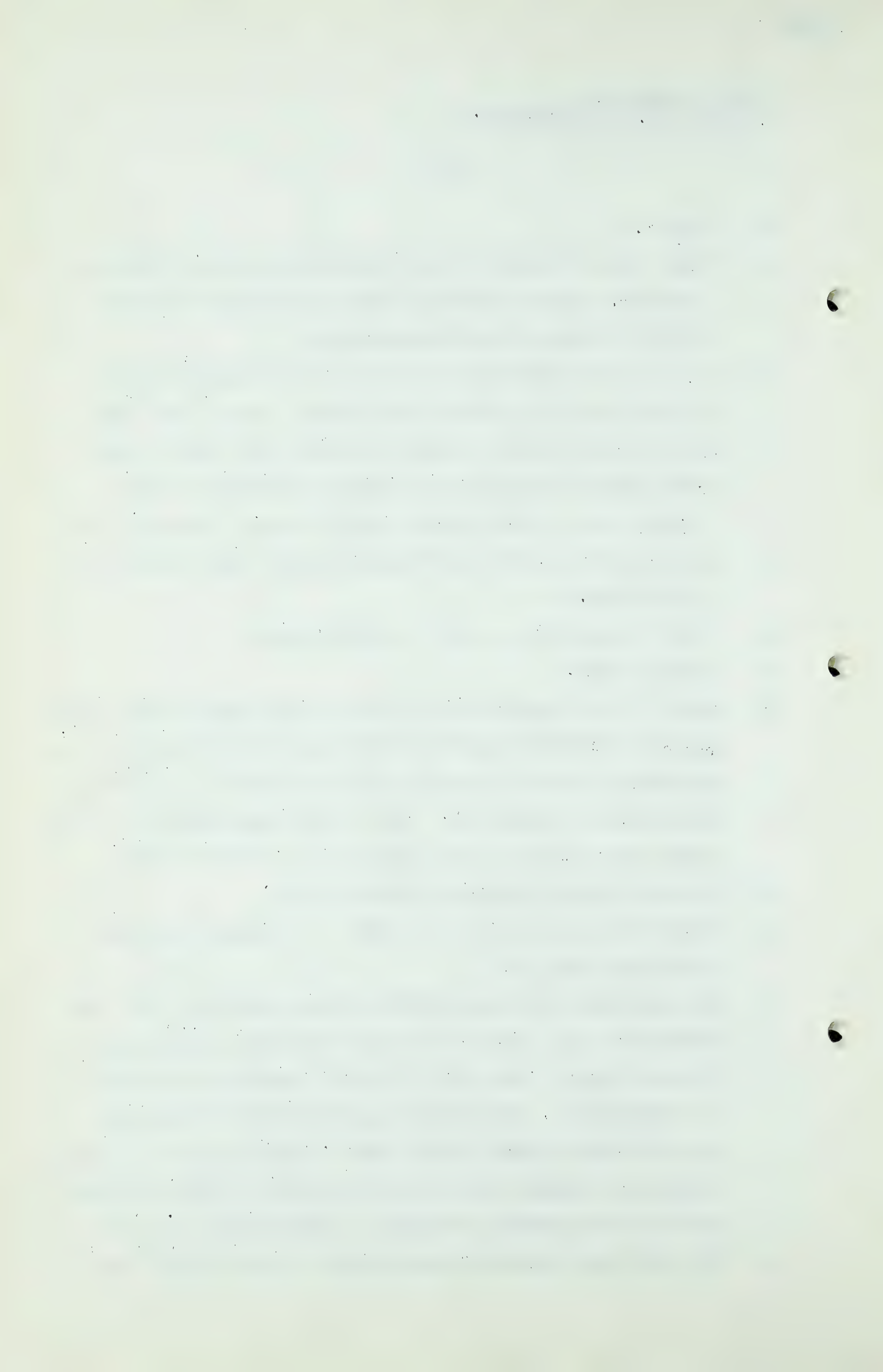
Q What is the situation with regard to gas in more than single phase? I am referring to gas which has oil entrained in it, droplets in it either at the bottom of the hole or during the course of production. What is the characteristic of the curve then? What are the figures on it, N equals what?

A The gas can have entrained vapours in it.

Q What would be the effect of that? Would your test show better than 1?

A We experienced that problem in testing deep wells that have rested for some time and there is a possible accumulation in the bottom of the hole of liquids, whether it is water or condensates. Usually the result of that is the slope of the curve is less steeper than .85 and as the well cleans up and the liquids are carried out of the tubing, the slope of the curve gradually returns to approximately .85.

Q So that from a practical application of this formula that



David G. Hawthorn,
Cr. Ex. by Mr. D.P. McDonald.

- 341 -

you do in those conditions have better than 1?

A Less than .85, it is a steeper slope.

Q Does it occur the other way? What condition would bring the well over 1?

A When the curve is flat or on a slope steeper than 1 - - will you bear with me just a moment until I think this through. It has been some time since I have gone over the nature of these curves. This condition might be incurred in a small tubing where wells are parafined up and the friction drop is slight for the amount of gas that was withdrawn and shows a flat slop to the curve and shows an abnormal flow of production from the well. I am sorry if I can not explain that too clearly to you.

Q Well, the only point was, if you would agree with me, that in practical application there has been a point in your deliverability calculations better than .1?

A Yes, we experience curves. It is mostly due to not having the well stabilized or other mechanical complications which give this an erratic result.

Q The reason I mentioned it was, I heard a discussion on this subject before and as I recollect, monograph 7 of the U.S. Bureau of Mines, there are a number of examples worked out there and several of them are in excess of 1?

A Yes. I think monograph 7 is rather an old publication and there has been a lot learned since then and much more experience with gas condensate wells in cycling projects has been gained since the writing of monograph 7 to the point where we now feel it is quite reliable to depend on this slope of about .85.

David G. Hawthorn,
Cr. Ex. by Mr. D.P. McDonald.

- 342 -

Q Well, let us look at one or two, two of your calculations here. Would you turn to Pincher Creek Field, your deliverability calculations in Exhibit 6. Would you check the 14th year?

A Yes, sir.

Q Now your pressure there is approximately 2800 pounds. Your well has been reduced by the previous production to about 2800 pounds?

A Yes, that is right.

Q And you calculate the average potential per well at 23?

A Average potential of the well is at 23.

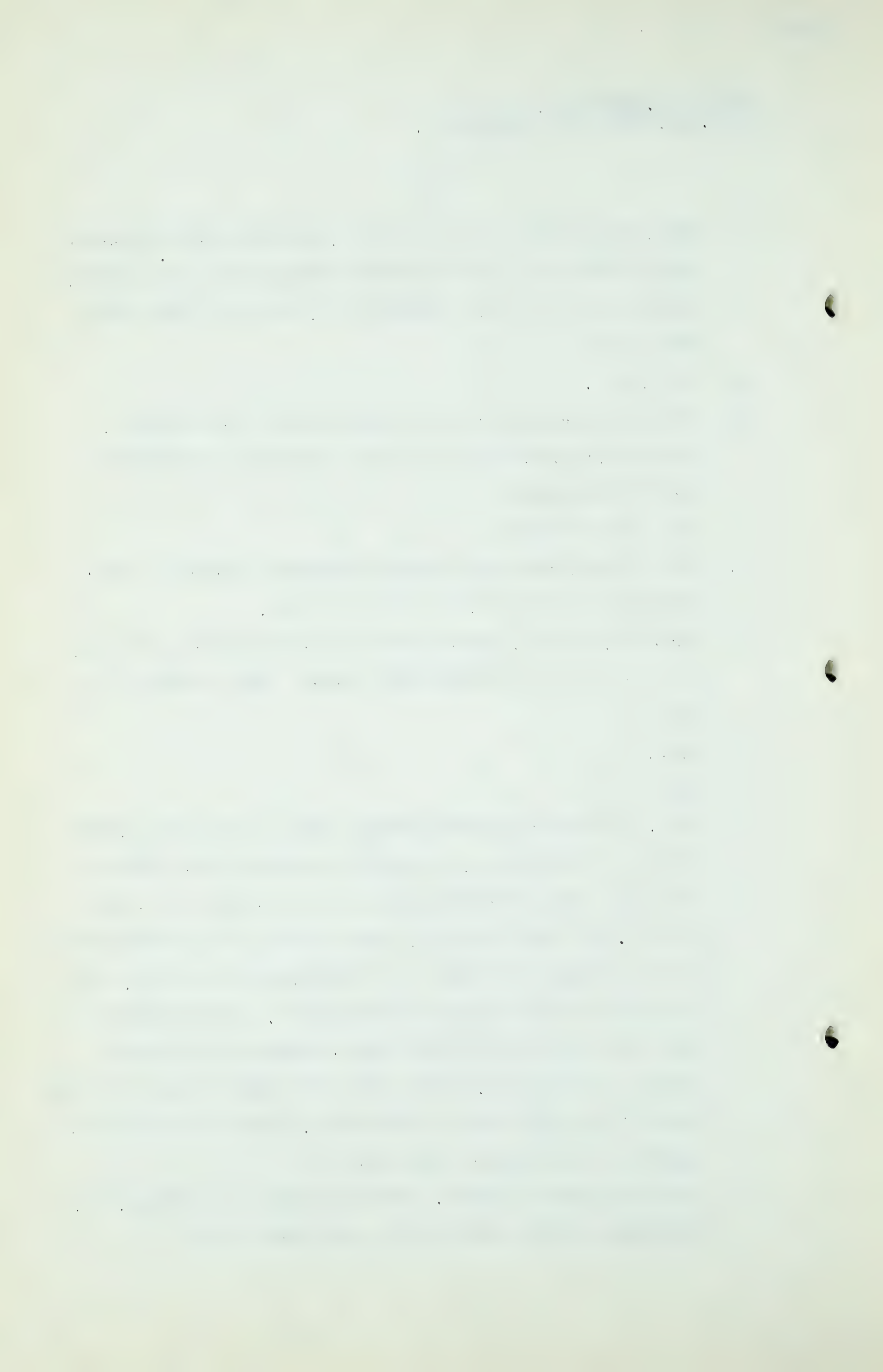
Q And do you know, in making that calculation what slope did you use in your deliverability curve? What slope did you use?

A .85.

Q .85?

A Yes. We merely took the average open flow and the average bottom hole pressure, or top hole pressure works just as well, and project a line down on log log paper on a slope of .85. And incidentally, I want to call to your attention in that regard that that is not ordinarily the term, slope is applied to the tangent of the angle. In monograph 7 they have used the slope as the co-tangent of the angle and not the tangent, so that it is the angle with a vertical and not the angle with a horizontal. That is the technical aspect of the thing and probably - -

Q I am not going to argue. The only point I am making, Mr. Hawthorn, is this, that on the other calculation of



David G. Hawthorn,
Cr. Ex. by Mr. D.P. McDonald.

- 343 -

deliverability of Pincher Creek Field which has been filed before the Board at 2800 pounds pressure the average potential for wells for the Field is calculated at 20 instead of 23. You may or may not have checked those previous calculations but it is less than what you have. Where you have 23 for that stated condition the Ford, Bacon & Davis calculation is 20.

A I see.

Q And that may arise out a difference in the use of .85 as against another slope?

A They may have used the actual test of these wells.

Q Yes, which actually was 1.15?

A I have not figured out what that slope was.

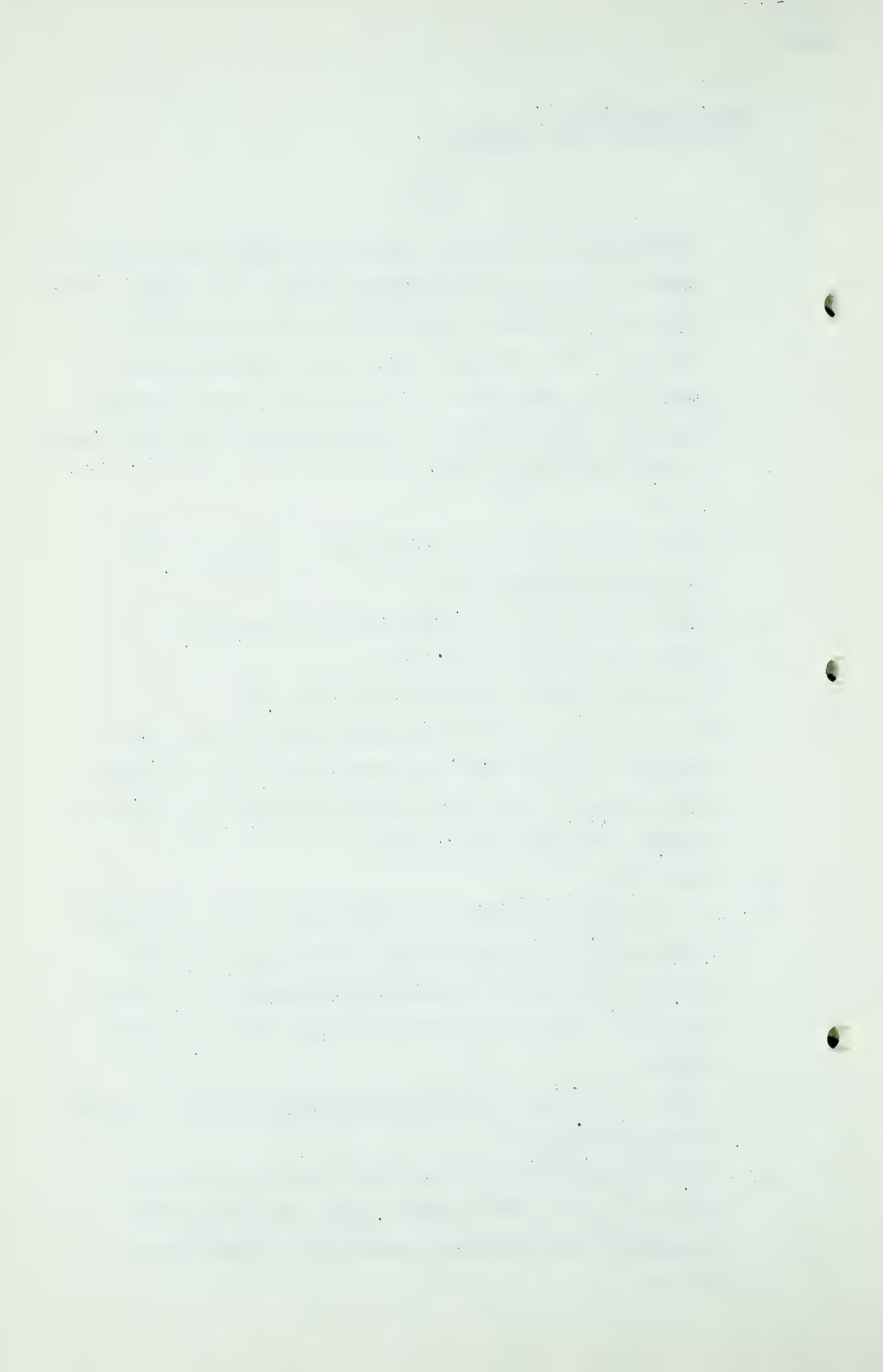
Q And if we take, and we will just look at the next one, Pendant d'Oreille Field, and we will take the 15th year. The average pressure there is 324 pounds and you show the average potential well at 3.9?

A Yes, sir.

Q On the other calculation of deliverability for the Pendant d'Oreille Field, which I think has been filed with the Board, at an average pressure of 335 pounds the open flow was 2.75. Now, in this particular case did you use .85 again?

A Yes, we have used .85 all the way through because no other data was available.

Q Well, taking the information from the tests that were available, Ford, Bacon & Davis used 1.15. Would that account for the difference between your estimate and theirs?



David G. Hawthorn,
Cr. Ex. by Mr. D.P. McDonald.

- 344 -

A It could. It would be in that direction, I believe. It would be more conservative than this estimate.

Q Yes. Now, Mr. Hawthorn, if you would turn to page 28. You deal with gas reserves in Northern Alberta and you point out, you list the number of fields that you have taken into account in your reserve estimate on the following table. Now, you did not take into account the Normandville Field in Northern Alberta?

A That is not listed.

Q And you have not taken into account the Whitelaw Field?

A That is correct.

Q And the Royce Field in the Peace River Area?

A That is correct.

Q The Wasbaskaw Field north of Lesser Slave Lake?

A No.

Q And coming closer to Edmonton, you have not included the recent wells in the Stony Plain area?

A That is correct.

Q Or the Chip Lake well?

A No, sir.

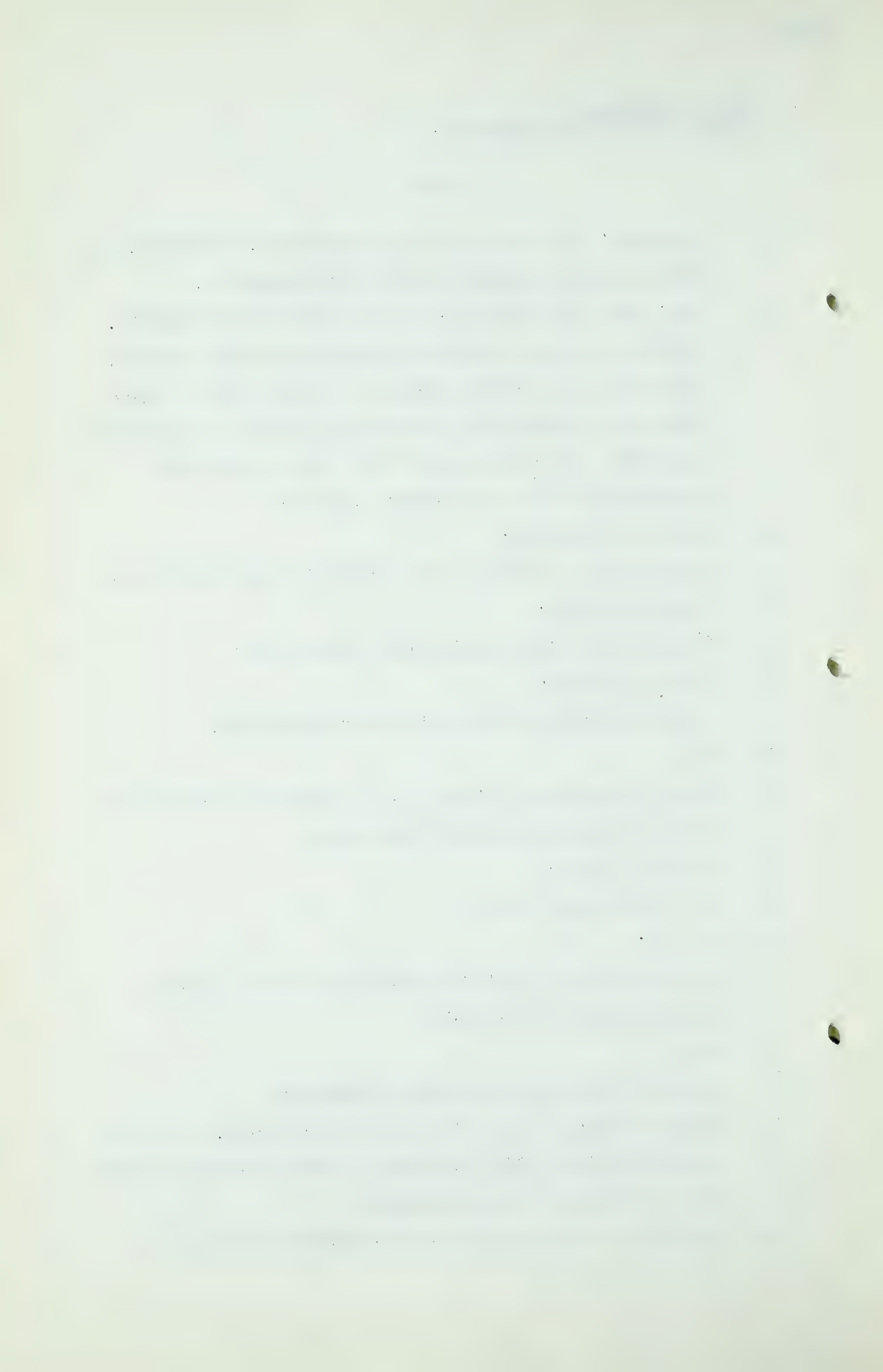
Q And you have not given consideration to the Acheson Field recently discovered?

A No.

Q And the Flint Area southeast of Edmonton?

A That is right. Those were all new discoveries. I would say for the most part they are all new discoveries and we have not taken them into account.

Q And there is also another area, the Waybrook Area?



David G. Hawthorn,
Cr. Ex. by Mr. D.P. McDonald.
Cr. Ex. by Mr. C.E. Smith.

- 345 -

A That is correct.

Q And in coming to Central Alberta you have not taken into account the Cessford discoveries recently?

A No, sir.

Q Now in making use of your reference here to gas available to pipelines, what pipe line did you have in mind with regard to that?

A Any pipe line.

Q Any pipe line. Would you have reference to the pipe line with which you are connected?

A No, sir. Where is that?

Q In your general summary?

A Oh, that is correct, just available to pipe line, any pipe line.

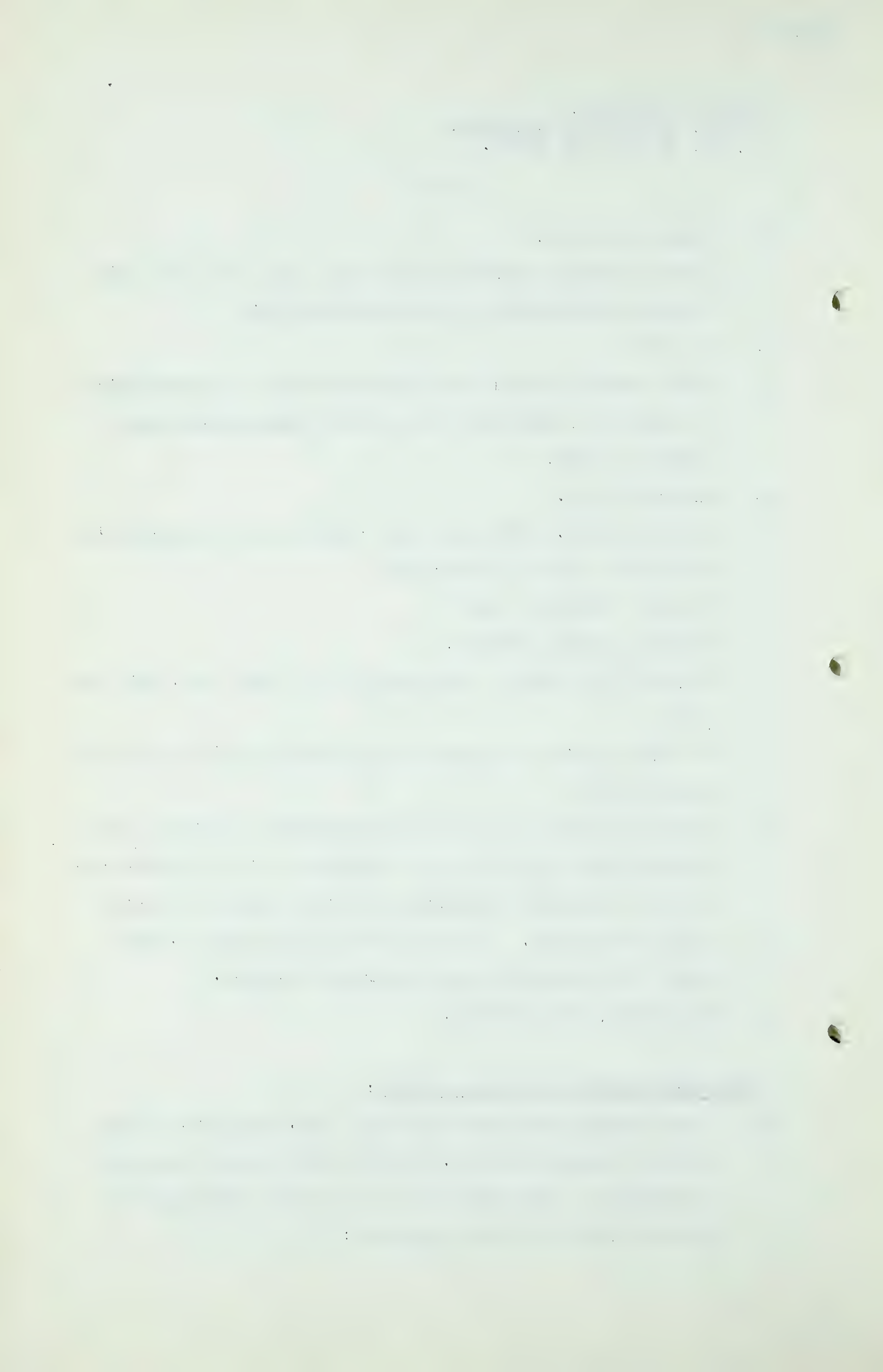
Q You had in mind the pipe line which was outlined to you by your clients?

A That or any other pipe line substantially separating the reserves that appeared to be committed for provincial uses and that gas might presumably be made available to pipe lines for export. Or another way of putting it, what might be considered as an exportable surplus.

Q All right, Mr. Hawthorn.

CROSS-EXAMINATION BY MR. C.E. SMITH:

Q Just probably about two questions, Mr. Hawthorn, in view of what has gone before. Will you first turn to page 19 of Exhibit 6, and referring to the second paragraph beginning with the second sentence:



David G. Hawthorn,
Cr. Ex. by Mr. C.E. Smith.

- 346 -

"All of the fields are comparatively small with the exception of Pendant d'Oreille."

Is that correct?

"To secure a figure for estimated marketable gas reserves, we have conditionally accepted Hume's estimates."

Hume's estimates have been referred to in various places throughout your submission. Can you tell the Board just wherein or in what document or where they find the estimates you refer to by Hume?

A Those are in his earlier submissions, not his recent report. His recent report was not available at the time of writing this.

Q Was it in a submission he made to the Dinning Commission?

A That is correct.

Q Is that correct?

A That is right.

Q Everybody seems to think we should take judicial notice of Mr. Hume in his reports but I would like to put a finger on which one you are talking about. That is the one throughout your submission?

A That is correct.

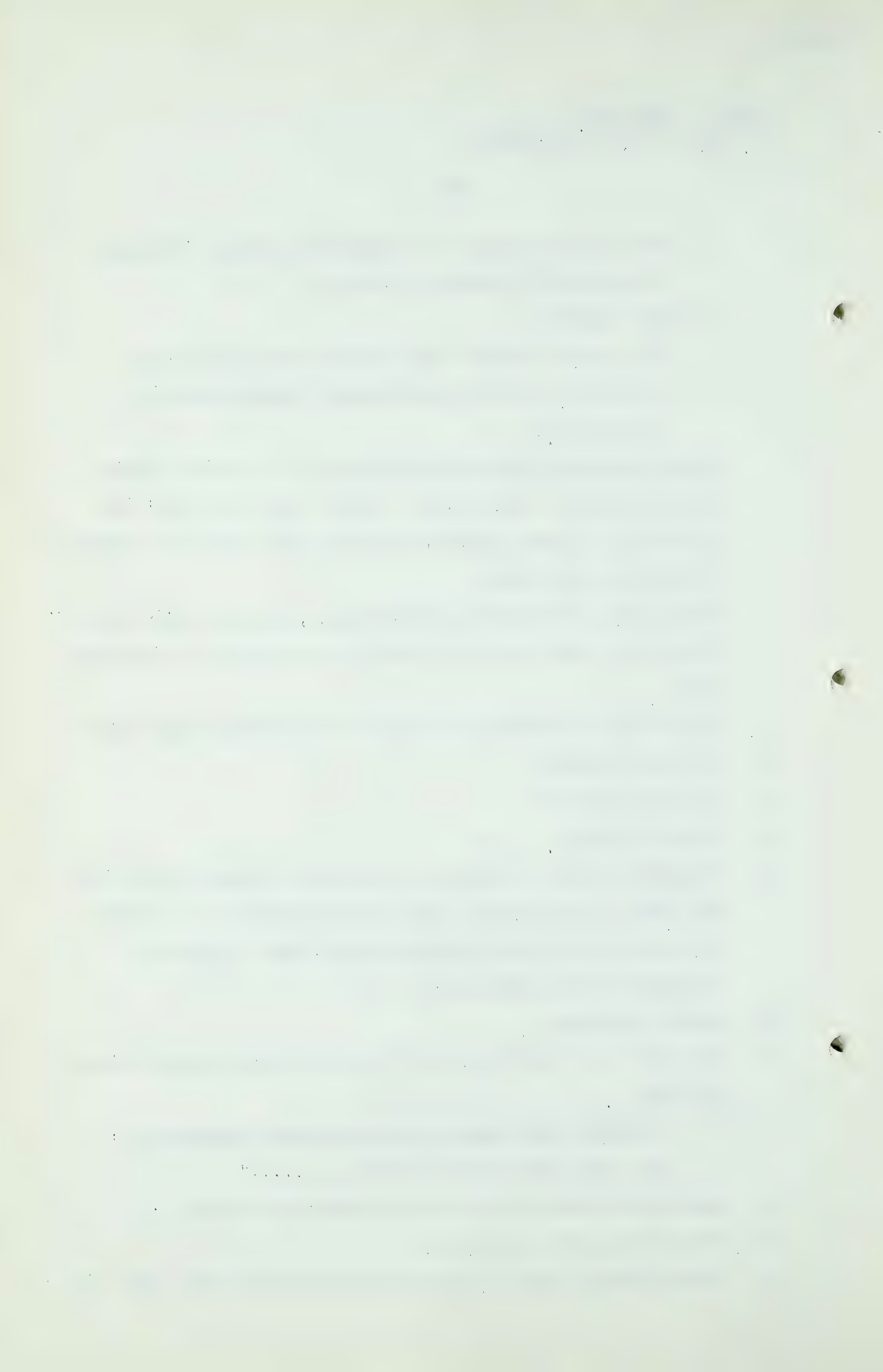
Q Is there any significance in the word "conditionally" where you say:

"We have conditionally accepted Hume's estimates, but have used Nauss' practice....."

A Maybe "provisionally" would be a better word then.

Q "Provisionally" upon what?

A Provisionally upon, if we went into further study, what our



David G. Hawthorn,
Cr. Ex. by Mr. C.E. Smith.

- 347 -

figures might reveal.

Q Well, let me go on to it then. You say later on, the second last sentence:

"We have studied the Pendant d'Oreille Field rather critically and are satisfied that the indicated gas reserves are as nearly correct as can be made with the available information."

I am putting it to you directly, did you yourself or did you and Mr. Lewis yourselves ascertain by your own study such things as acreage, thickness, porosity, connate water, abandonment pressure, discounts and so on?

A In a general way area and thickness and acreage feet. The other factors were taken from the submission of Hume and others, which have all used the same factual data on porosity.

Q As far as you yourself are concerned, you have not available at the moment in any event your own opinions and conclusions therefrom with respect to all these matters and bring out a net result?

A All the factual data, no.

Q Does that apply to all the estimates that you discussed, such as Morinville, Pincher and the rest of it?

A For the most part, yes, sir, Mr. Smith.

Q I mean, is there some exception you want to mention?

A No, I do not believe so because by and large we have not had the factual data on porosity, core analyses and so forth made available to us.

Q You probably heard this morning, or maybe by now or by noon

David G. Hawthorn,
Cr. Ex. by Mr. C.E. Smith.

- 348 -

you will have heard all of what the Chairman said at the opening this morning wherein he, on behalf of the Board, I would say reminded all people present and traced what the Board wants to get. I take it that you can get such detail probably for the joint Hearing that is required in that statement by the Chairman? This is just an illustration of what I am getting at.

A I am not sure that that factual data will be made available to us, no, sir.

Q Subject to your counsel's instructions and what you can have made available to us, I take it you will attempt to do that?

A We have attempted in the past and have been refused.

Q Well, you know that some of them, I just have in mind at the moment Dr. Nauss, had supplied that type of information, probably some of Mr. Nolan's people, I have forgotten. Do you mean available because you can not get it from the people who have it or it is not available?

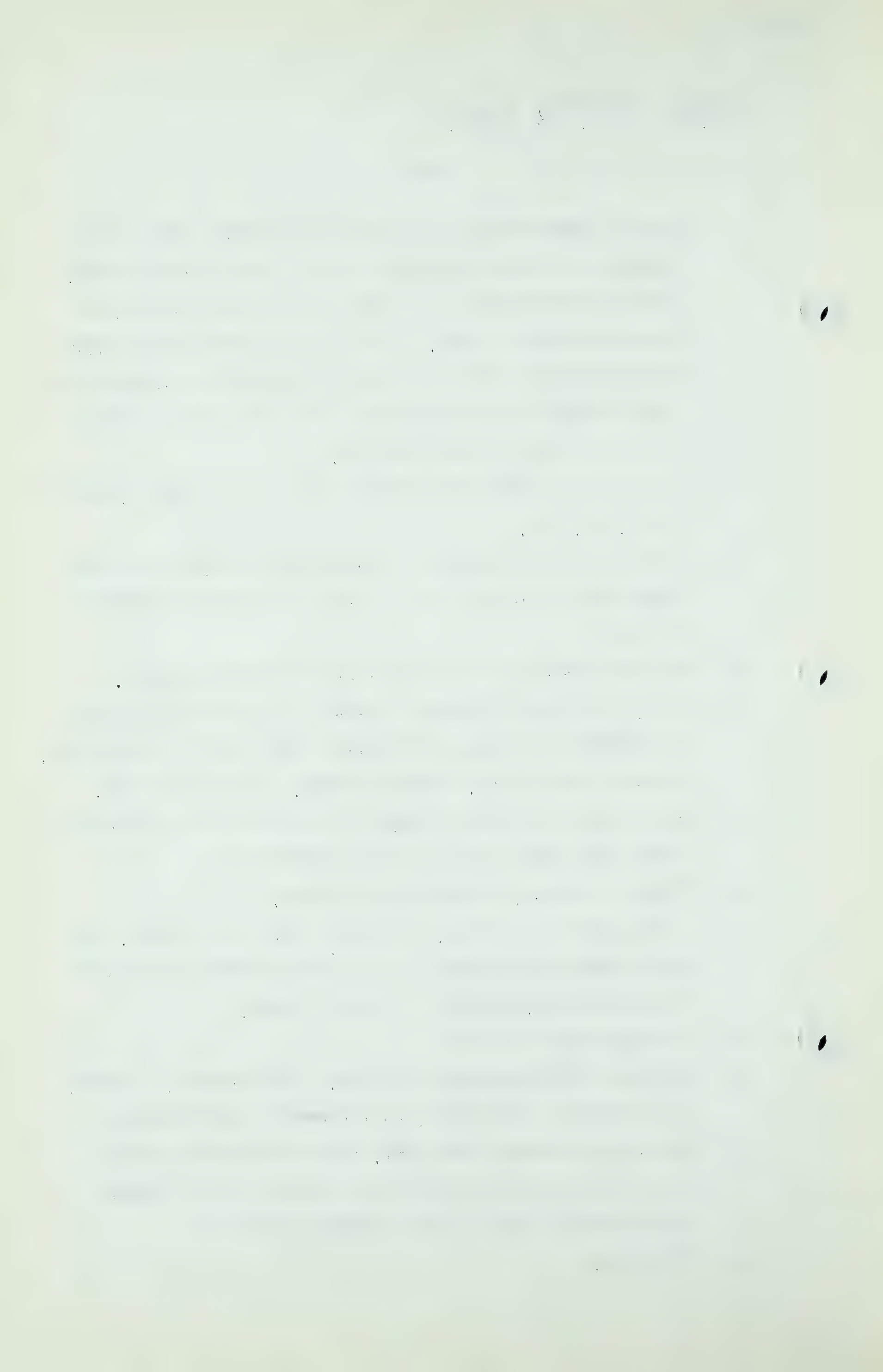
A That is correct, we have been refused.

Q I am glad to hear that. I think I asked you before, the same answer would apply to all your estimates throughout the submission, Exhibit 6, is that right?

A Substantially so, yes.

Q Just one other question, I think. You referred, I think, in the main to one place, as I remember, particularly Morinville anyway, that a Mr. Cook had made available or had done something for you to assist you in respect to Morinville, and I think Jumping Pound too?

A Yes, sir.



David G. Hawthorn,
Cr. Ex. by Mr. C.E. Smith.
Ex. by Dr. Govier.

- 349 -

Q And have you his data, if you understand what I mean, upon which you made further observations, or just something that he did that you accepted?

A Yes, sir, he has made some investigation under our supervision. We have those work papers, yes, sir.

Q Do you know whether or not he is going to be called as a witness?

A I do not know.

Q I suppose that is a matter I should ask Mr. Martland.

MR. MARTLAND: Yes, we will make him available.

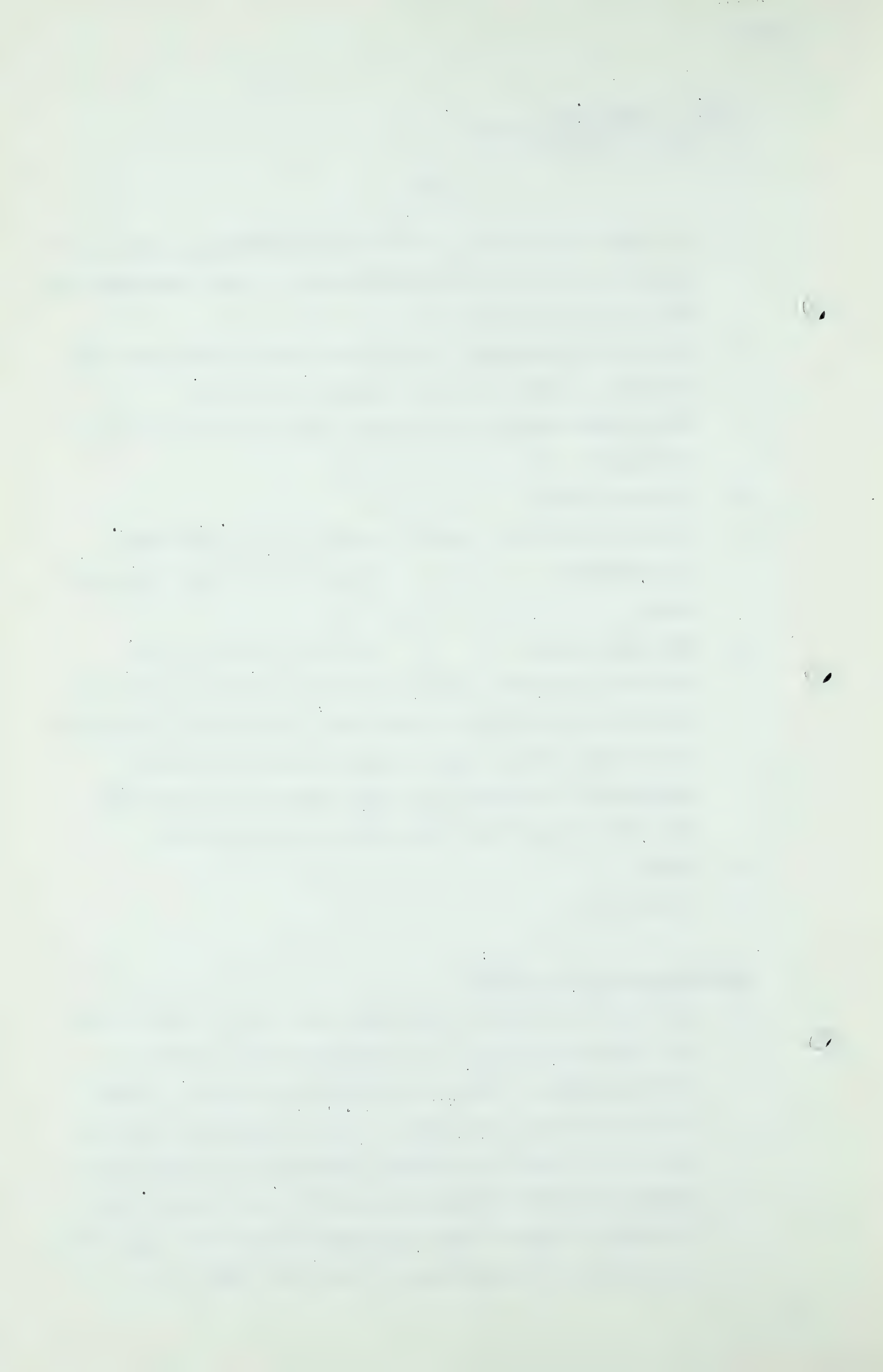
Q MR. C.E. SMITH: To help you with this, whether or not your counsel requests you, or whether anybody else does, will you carefully, when it is transcribed or in front of you, observe the things the Board has reminded all counsel of in that statement this morning for fear you are back again here on October 30th?

A Right.

Q Thank you.

EXAMINATION BY DR. GOVIER:

Q Mr. Hawthorn, I have a few questions I would like to ask you concerning Exhibit 7 on principles and methods of deliverability. First, with reference to page 9, just a few minutes ago in answer to Mr. McDonald you indicated that in the event of turbulent flow the slope might fall beyond the range corresponding with $N = 0.5$ and $N = 1.0$. I wonder if that is what you meant because that would seem to me to be in contradiction of what Mr. Lewis said



David G. Hawthorn,
Ex. by Dr. Govier.

- 350 -

yesterday. My understanding of Mr. Lewis's evidence yesterday was that in the event of fully developed turbulent flow N would be equal to 1, and in the event of purely viscous flow N would equal .5. It would seem to me in answer to Mr. McDonald you indicated something different. Perhaps, Mr. Hawthorn, you might want to confer with Mr. Lewis on that and let us know later.

A May we take a moment now?

Q Yes.

A Will it be satisfactory if I just agree with the statement that Mr. Lewis made yesterday?

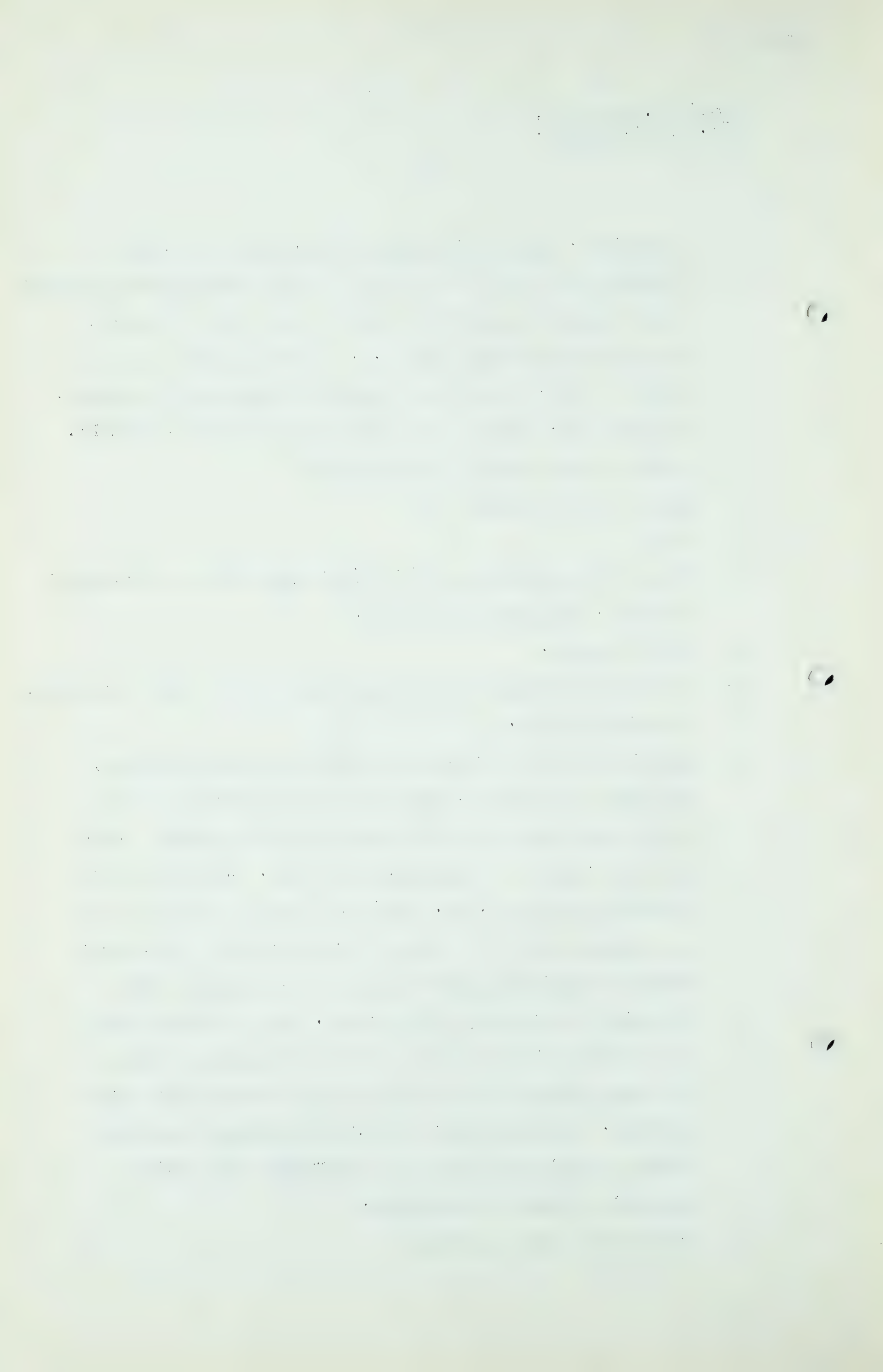
Q Fine, thanks.

A If I have confused the statement, as I said, why I am sorry, I make it clear.

Q Another matter in connection with this slope business, you were asked by Mr. McDonald what the effect on the end values would be of the presence of two phases, that is, the connate or something like that. Would you agree generally speaking, Mr. Hawthorn, that the effect of the two phases would be to cause a curve in the line rather than to change the general slope of a straight line?

A Probably to accentuate that curve. All of these curves, all of these lines, we will say, have curves in them at the very low rates of flow and at the extreme high rates of flow. When we refer to them as a straight line we refer to them, that they are a straight line within practical limits of producing.

Q Within the middle portion?



David G. Hawthorn,
Ex. by Dr. Govier.

- 351 -

A Within the middle portion, the working portion, so that probably your calculation there would be right, with excessive amounts of fluid might extend that curve a portion.

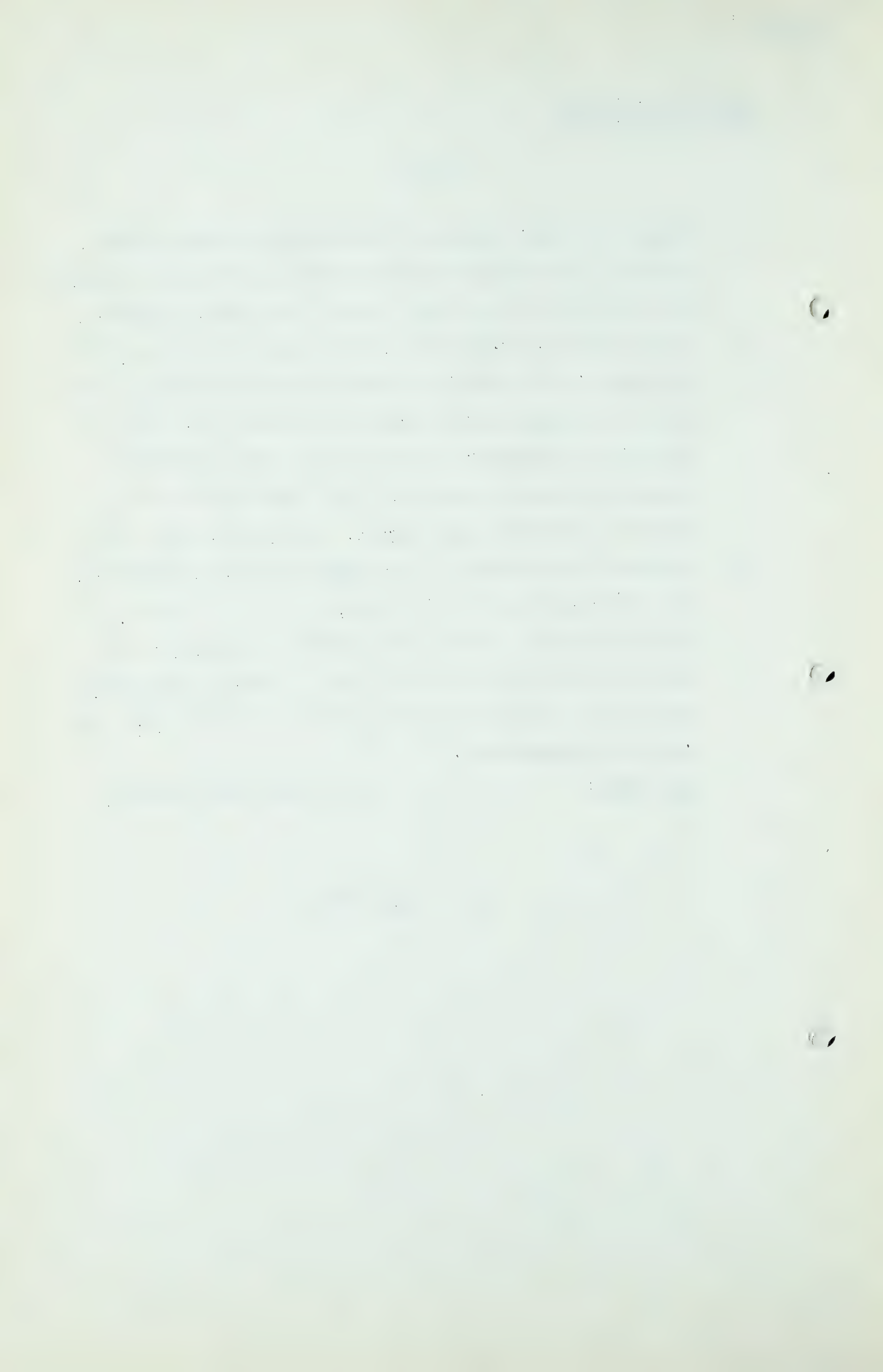
Q In any event, Mr. Hawthorn, do you agree with this, that the Railroad Commission of Texas and various bodies in the States of Kansas and Oklahoma believe that if a test indicates an undervalue that does not fall within the range of .5 and 1, that test is in error and the test should be conducted over again. Do you agree with that?

A I think I can answer you that there is such a regulation now. Mr. Lewis can verify this, if you do not mind, but I believe there is a Railroad Commission regulation in Texas now that any test that comes to them on a gas well that is of a greater slope than 1, or a lesser slope than .5, it is disregarded.

MR. LEWIS:

That is my understanding.

(Go to page 352)



Q And is that based on experience gained in the testing of wells and since the date of publication of Monograph 7?

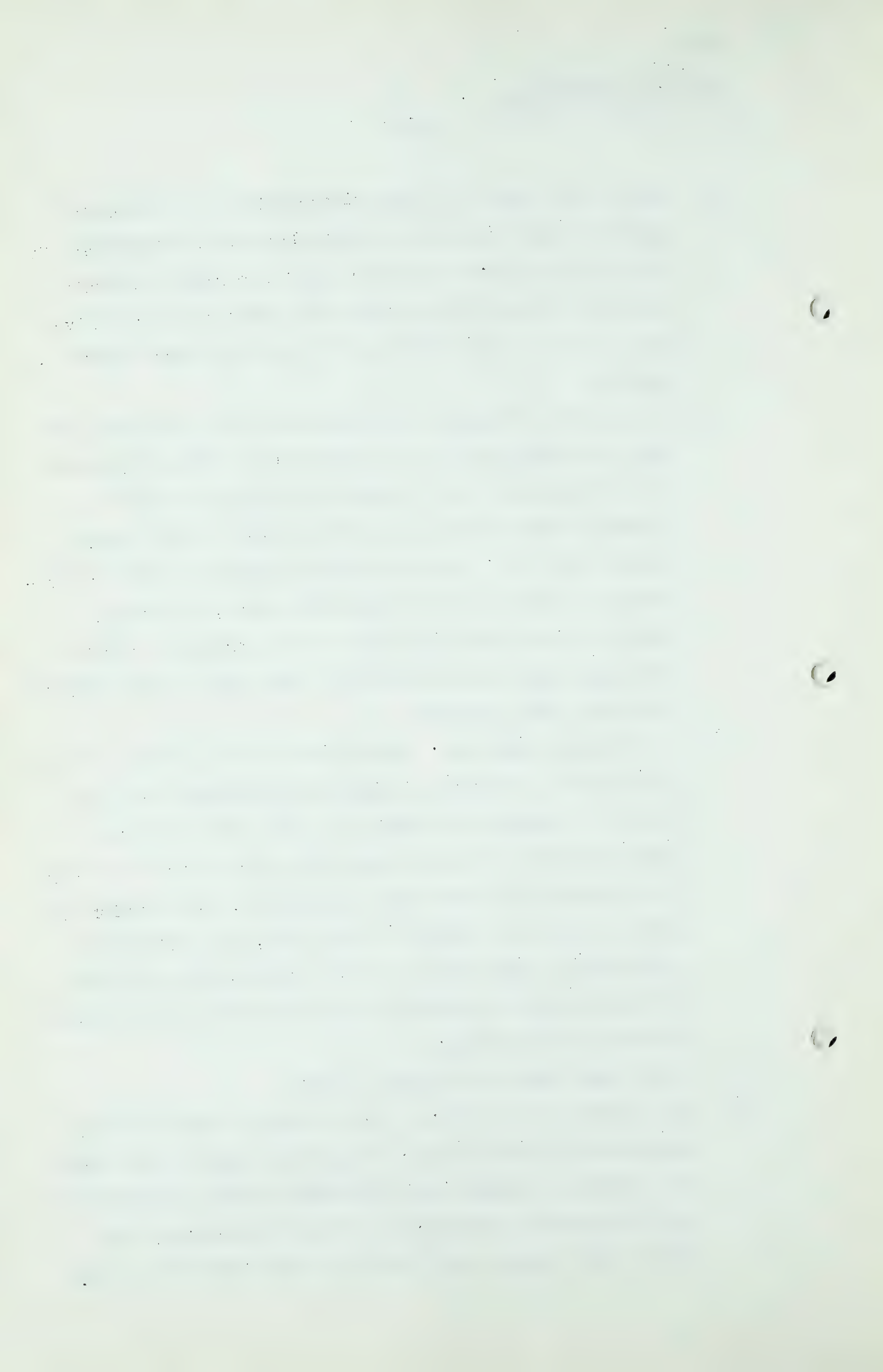
A I would say so. There has been much work done on this question of flow rates on gas wells over the past five years, and it is all subsequent to the work done on Monograph 7.

Q On Page 18 of Exhibit 7 reference is made to the fact that when the working well head pressure gets below the gathering line pressure it is usually necessary to instal a compressor and the figures of 850 pounds and 800 pounds are referred to. Could you tell me whether in your estimation of the reserves of marketable gas, as given in Exhibit 6, you took cognizance of the pressure at which a well might have to be abandoned in the light of the possible gathering line pressure?

A In a general way, yes. Some time back the question of the economics of producing a well to low pressures and the expense of installing compressor plants and operating compressor plants was critical when prices of $2\frac{1}{2}$ to 3 cents per thousand cubic feet were being paid, but now with the price of gas as it stands in the field, it is virtually sufficient to wipe out all of the questionable economics and carry the low pressure fields to a very low abandonment pressure in most cases.

Q What figure would you suggest there?

A The limits are too wide. I do not think I would care to suggest any average figure, because the depth of the wells are involved ranging from a thousand to many thousand feet, and the size of the wells, the type of reservoirs, and many other things, and it would be very difficult to say.



David G. Hawthorn,
Cr. Ex. by Lr. Govier

- 353 -

However, I might go so far as to say that we are considering abandonment pressures as low as 100 pounds in our deep reservoirs.

Q What abandonment pressure did you consider in your estimation of the reserve at Pincher Creek?

A 400 pounds.

Q At the well head?

A I think so. I think that is well head pressure. Yes, sir, that is well head pressure.

Q And you believe it would be completely practical and completely economical to pick up gas at the well head pressure of 400 pounds and deliver it into a gas gathering system even though that would necessitate a compressor, or might necessitate a compressor?

A I think the deliverability of those wells will be sufficient to do that at that point.

Q And you base that on the fact that you would expect the value of the gas to be sufficient to offset the cost, the depreciation and operating costs of a compressor installation, is that right?

A Yes, sir. I think the rate of production at that low pressure will provide sufficient daily income to continue the operation. That is the essence of the whole economic analysis.

Q To take another example, Mr. Hawthorn, in the case of the Viking-Kinsella field, what well head abandonment pressure did you use?

A 100 pounds. That is the one that has been used in the material balance of Hume and Ignatieff.

Q You would agree with, more or less, the figure of 100 pounds?



David G. Hawthorn,
Cr. Ex.by Dr. Govier.

- 354 -

A Yes.

Q What about the economics of picking up that gas at 100 pounds and delivering it into a pipe line or a gathering system?

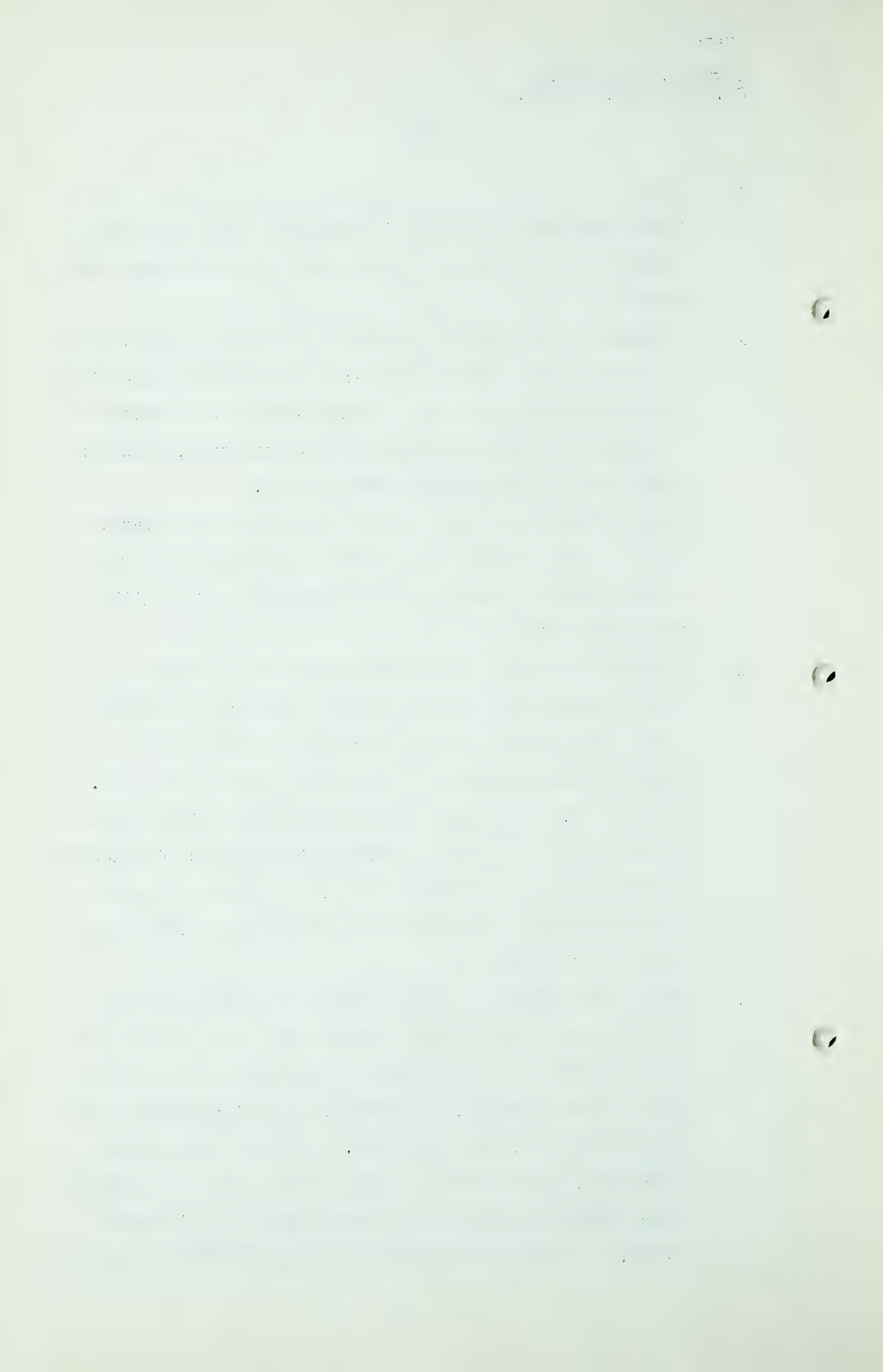
A I think at this stage I can say it looks all right, that is, taking into consideration the trend of the price of gas and everything. One might suppose that it could possibly be carried to even lower pressure at that time, although that would be looking far down the road.

Q But, in any event, you believe it would be conservative and at least practical to consider marketable reserves to a well head pressure of 100 pounds in a field like Viking-Kinsella?

A I would say that I think that would be all right with what little study I have made. I have agreed with the rest of them, but that is not founded on any detailed study of average deliverability of the wells that we have made.

Q Tell me, Mr. Hawthorn, why did you choose a figure of 100 pounds at the well head in Viking-Kinsella and 400 pounds at the well head in Pinchor Creek? They are both well head pressures? What makes the economics so different in those two cases?

A Well, the expense of operating and continued operation of the deep wells and the problems that are involved in the deep wells are much more severe than in the shallow wells, and we believe, in general, they might have to be abandoned at a higher pressure. We may learn, with experience, that in cases they may be able to be carried lower, and in cases that it might result in being much higher. I know the question is now propounded in one of



David G. Hawthorn,
Cr. Ex. by Dr. Govier.

- 355 -

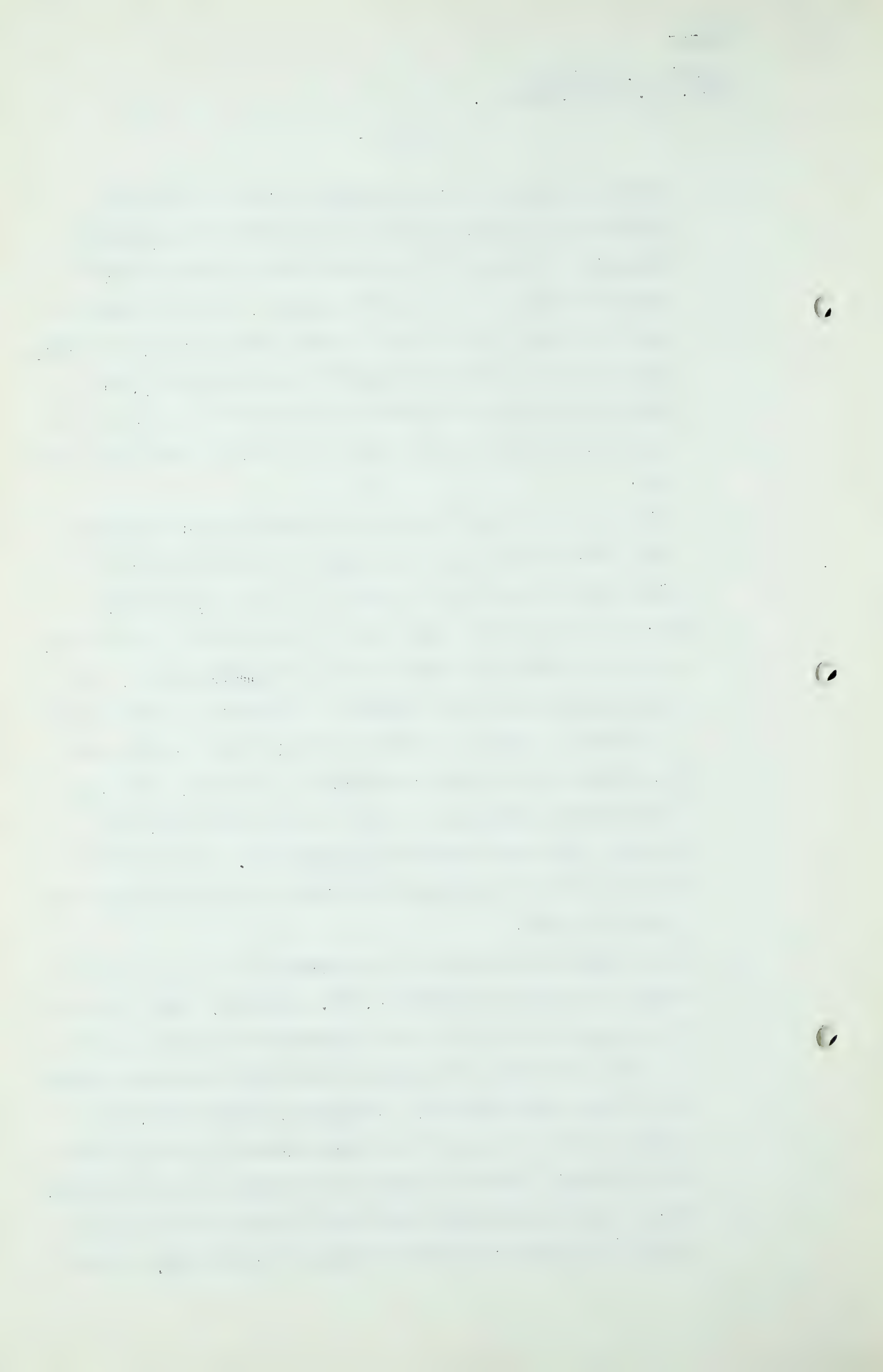
our very extensive gas condensate fields in the Gulf Coast as to the practicability of having or depleting a reservoir of nine or ten thousand feet in depth down to any such voidage as 100 or 200 pounds. There is speculation as to what will happen to the cement jobs, the casing cement jobs, and how the formation will stand up, and they are economical considerations that we have had no one in the production business that has had any experience with yet.

Q Are there any fields that you are familiar with elsewhere that would be more or less comparable to Pincher Creek which have been nearly abandoned or nearly produced?

A No. In that regard, when you say those nearly abandoned, it ties in with the remark that I just ~~made~~, namely, that our experience with the complete exhaustion of gas fields is limited. There are very few fields that we can point to, except the shallow gas fields in the East, that range down from one thousand to two thousand, possibly, feet or so, that have been carried to exhaustion. Most of our deep Gulf Coast and Texas and Oklahoma fields have just been touched to date.

Q I have some other questions concerning the deliverability data in the back of Exhibit 6, Mr. Hawthorn. First of all, with respect to all of these deliverability data, I take it from your Exhibit 7 that you would agree with the general thesis that deliverability diagrams and deliverability schedules can, at best, be no more accurate than the basic data on which they are based and on which they are founded?

A Yes. I am glad you mentioned that, because I am afraid in my direct testimony I did not carry it far enough. And at



David G. Hawthorn,
Cr. Ex. by Dr. Govier.

- 356 -

this time I would like to further explain that they are of the rankest kind of projections because they are based on so many factors that can show or that can be shown to be wrong in the future that we must recognize their limitations. In the case of Pincher Creek, we are basing our reserve estimates on what two wells show, we are basing our average open flow on what two wells show, and we are projecting that down into the future to the abandonment of the property. Now, if the reserves should show to be half as much, or twice as much, the deliverability analysis will be changed correspondingly. And if the average open flow of these two wells is later shown to be widely wrong, or widely different, I should say, because it is not a matter of error, it is the matter of the different way in which things develop over what we see them as today, why, the deliverability schedule will be altered accordingly.

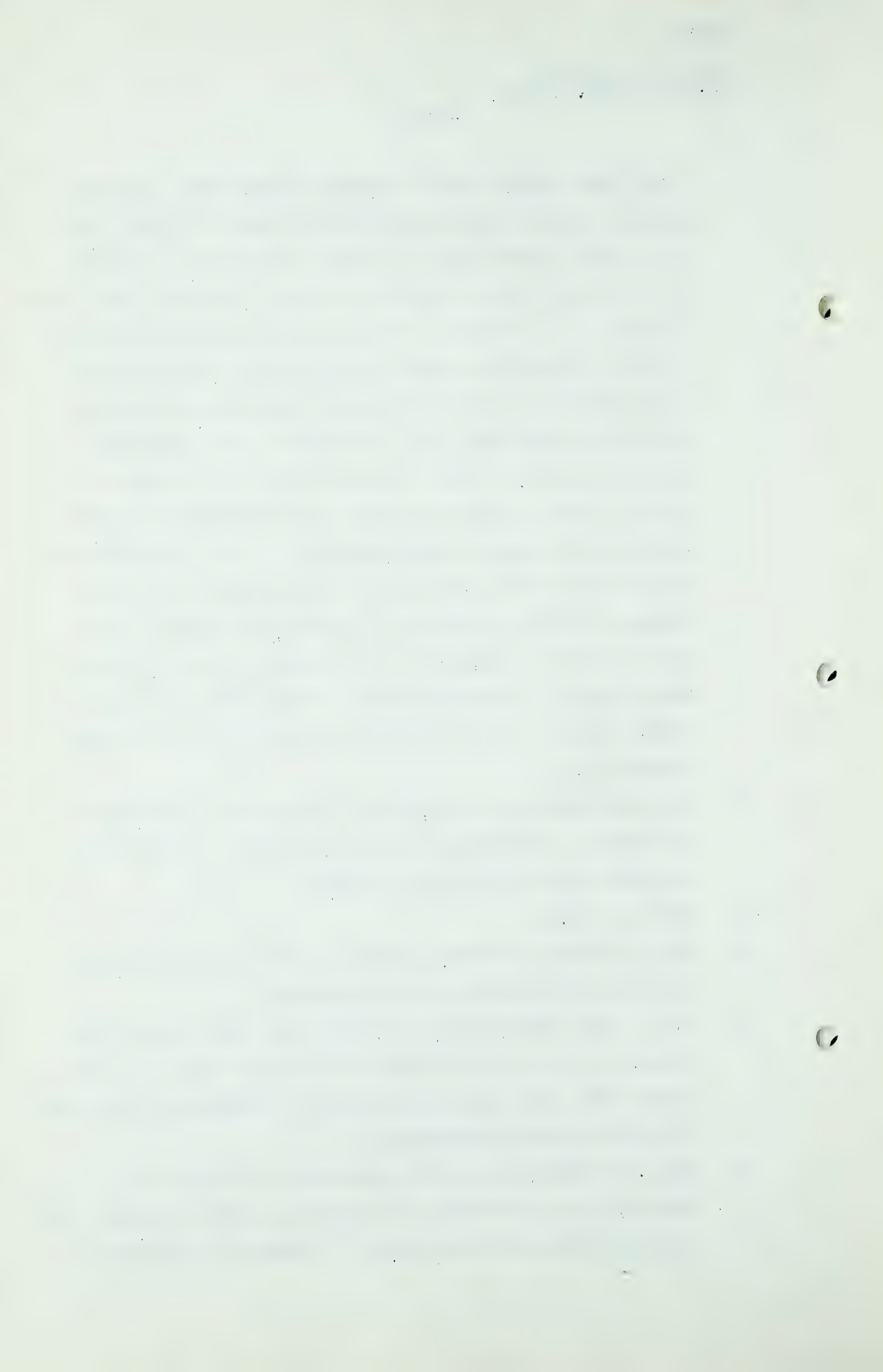
Q So that what we should examine, when we are considering this matter of deliverability is, really, the basic data on which the calculations are made?

A That is right.

Q We can assume, I believe, that you can make calculations correctly if you have the correct data?

A Yes. And arithmetically, we will say, this analysis is correct, but if the basic data changes or shows to be different over what the premises and the assumptions are, then it will be changed accordingly.

Q Now, Mr. Hawthorn, in that connection, on Page 34 of Exhibit 6, you introduce the question - just a minute, I am not sure I have the right page. On page 35 of Exhibit 6



David G. Hawthorn,
Cr.Ex. by Dr. Govier.

- 357 -

you continue with the question of the deliverability at Pincher Creek, the Pincher Creek field, and you say, "The two wells so far completed at Pincher Creek had an open flow capacity of 45 and 83 MMCF per day, or an average of 64 MMCF per day." Am I right in assuming that that is, in effect, the basic data, apart from the reserve data, which you used in calculating the deliverability schedule?

A Yes, sir.

Q Did you inquire into the origin of that data?

A Pardon?

Q Did you inquire into the origin of that data?

A Yes, I have the data.

Q Was the data obtained by back pressure tests or by open flow tests?

A Those were obtained by the conventional back pressure test.

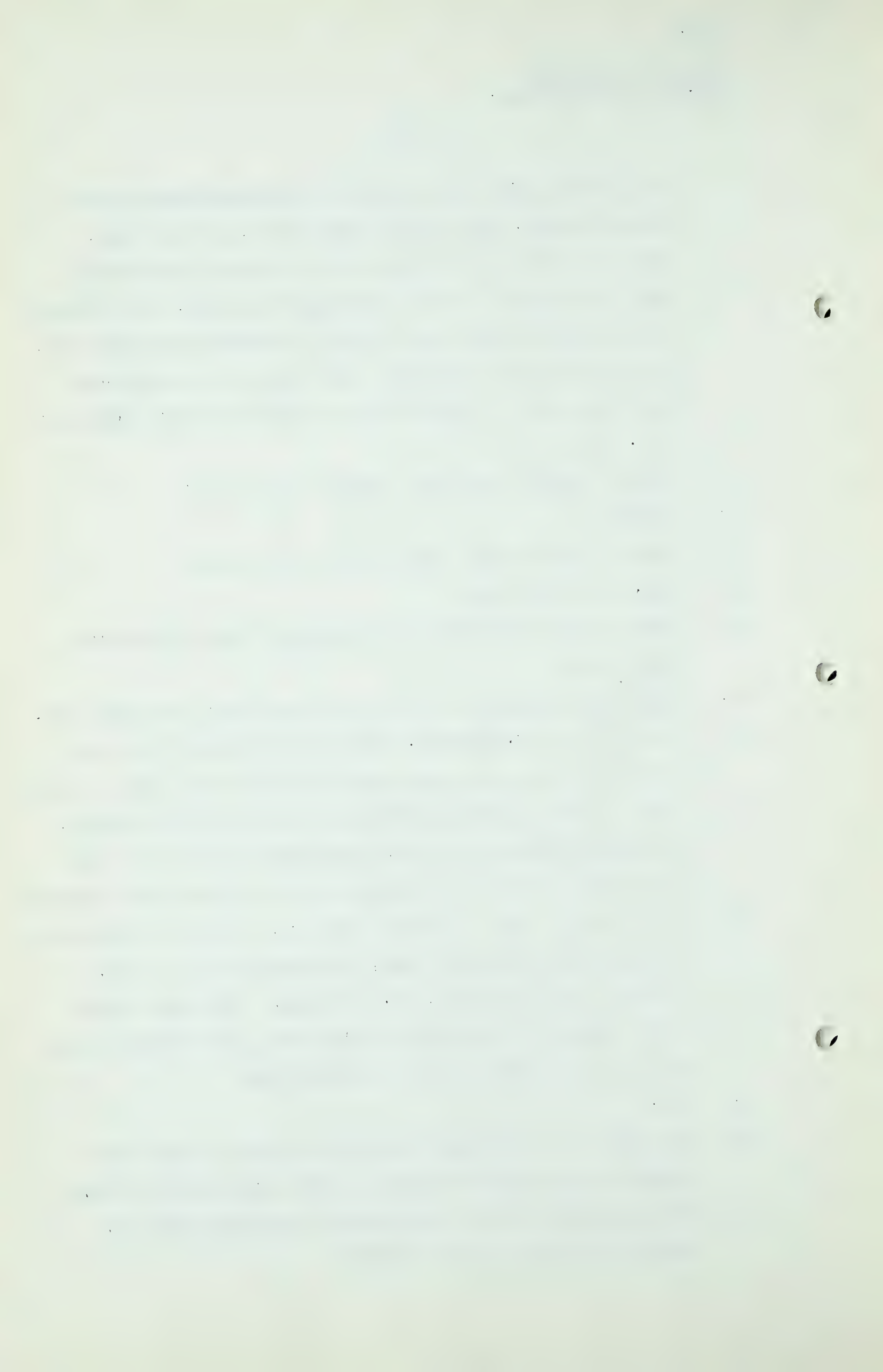
Q Do you know, Mr. Hawthorn, whether the data was the same, or are the same ones that were filed with this Board earlier? Just a minute, I think I can give you a reference number. Do you know whether the back pressure data are the same ones that were filed as Exhibit 80 in the Westcoast hearing?

A No, I do not, but I presume they are, because if the source of the data is the same, why, they should be the same.

Q I think likely they are, Mr. Hawthorn. We might assume that, looking at the back pressure data, and I have a copy of the chart, Exhibit 80, in front of me?

A Yes.

Q It seems to me that your figures of 45 and 83 have been taken as the terminal figures on two curves, one of them labelled Number 1 and the other one labelled Number 4. Would you like to look at those?



David G. Hawthorn,
Cr. Ex.by Dr. Govier

- 358 -

A Yes, I would. Yes, sir.

Q The curve labelled Number 1 is the back pressure test conducted on the well, I have forgotten which one, after acidization, is that right?

A The curve Number 1 is flow tests on Pincher Creek Number 1 conducted in March, 1948, and it is the open hole section 11,755 to 11,927 exposed. Not acidized. Absolute open flow potential, 45 MMCF per day.

Q That was before acidization?

A That is right, that was before acidization.

Q Did you look at the slope of that back pressure test, Mr. Hawthorn?

A Yes.

Q Does it lie within the range that you suggested in Exhibit 7 should be considered as a proper range?

A It looks to me that it is probably a little more than the slope of 1?

Q I think it is quite a bit more than 1, isn't it?

A Yes.

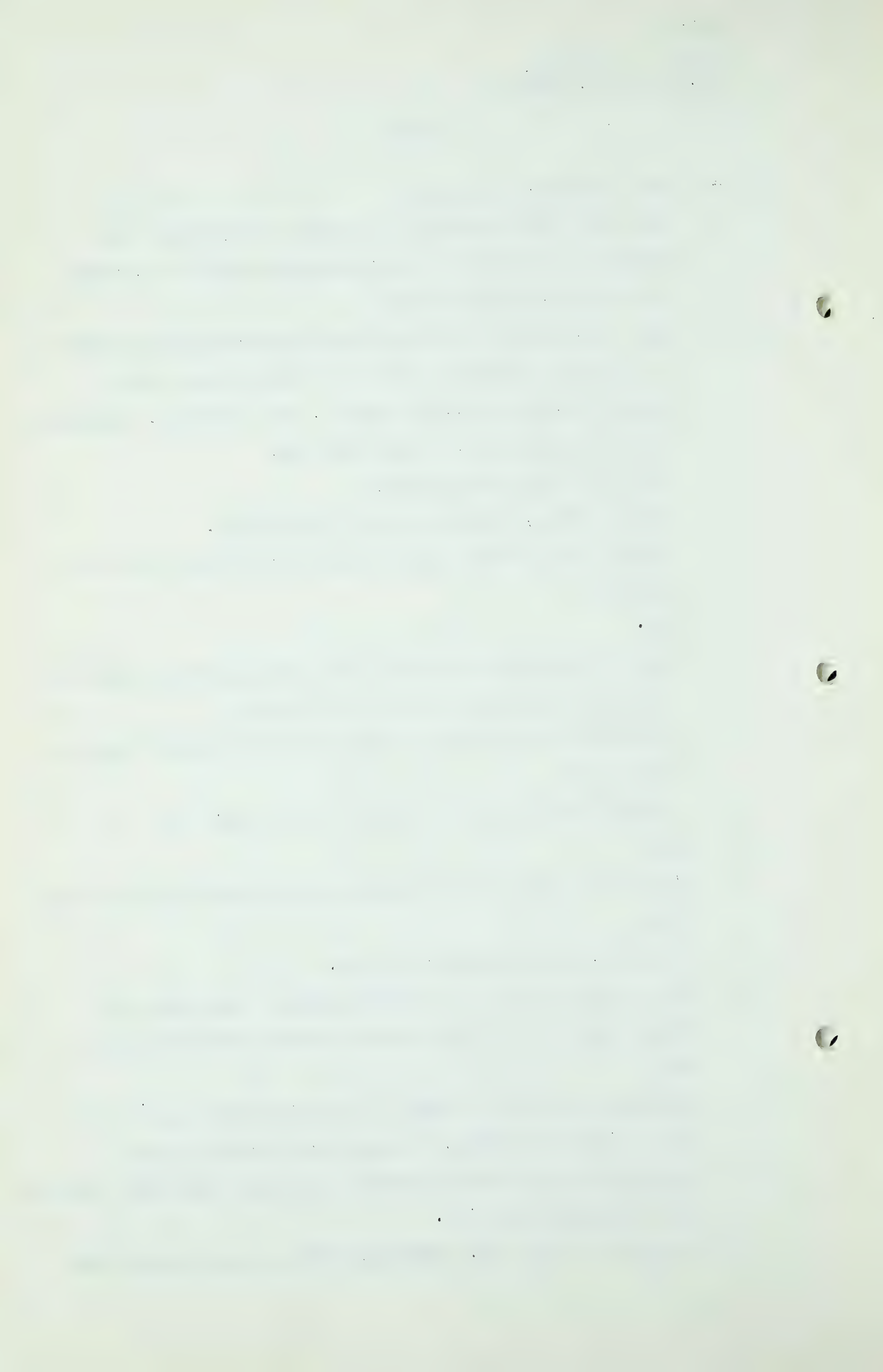
Q Would that indicate that the 45 figure might be quite a bit out?

A Yes, sir, it could indicate that.

Q Do you believe that on further study of this data you might arrive at a figure which was more reliable than 45?

A Possibly an extended study of the thing would lead you to use a different figure. I have merely taken the two figures that have been provided to us and used that and used our slope of eight five.

Q I suppose, though, Mr. Hawthorn, that you would agree that



David G. Hawthorn,
Cr. Ex. by Dr. Govier.

- 359 -

that data there was limited, to say the least, and the indications of the data are that they may not be too reliable even of the data that was available, would you agree with that?

A Well, in this particular test, it looks like it possibly could be out. The tests of well number, Marr Number 1, looks like a very good test, and it is the larger one.

Q My recollection of curve Number 4 is that there is only one point, am I right?

A That is right.

Q Do you believe it is a proper statement to say that the test may be a reliable test if it is only based on one point?

A I think we have come to the thinking that one good point is better than three bad ones.

Q I would certainly agree with you on that, Mr. Hawthorn.

A I say that not facetiously, because we are coming to the point.....

Q I appreciate what you are getting at?

Awhere we would rather try an open flow capacity curve, draw an open flow capacity curve on a meter reading and a good top hole pressure taken throughout a day, than we would to rely on an individual test that was performed along exact technical lines and secure three points, none of which, or, I mean, any one of which might be questioned.

Q I see what you are driving at, Mr. Hawthorn. I am glad that you mentioned it. But in this particular case isn't it true that the one point that we are referring to is a point which represents a flow, a measured flow on the one hand, and a calculated squared pressure drop on the

David G. Hawthorn,
Cr. Ex. by Dr. Govier.

- 360 -

other hand, and the calculation in those taking into account a very nebulous friction correction? I am not trying to criticize you in any way, Mr. Hawthorn, but I would like to get your evaluation of the reliability of these two figures, 45 million and 83 million, because, as you have pointed out in your report, that was all you had to go on in the Pincher Creek field?

A That is right.

Q And I think a good deal hinges on those two figures, and I think it is important that the Board be in a position to evaluate the reliability of those figures?

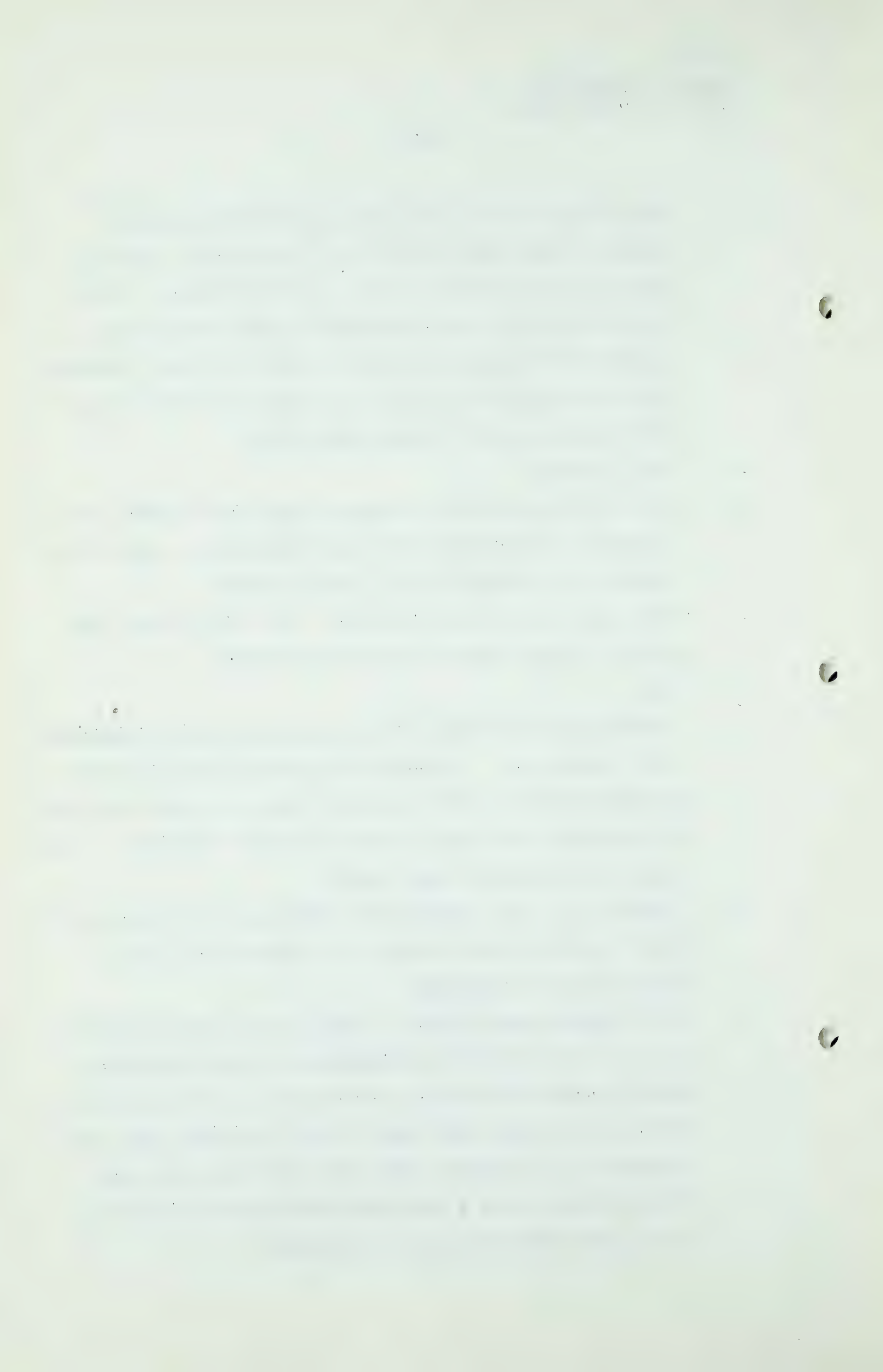
A Well, in view of this discussion, I am sorry to say that in our study we did not go into it farther.

Q Yes?

A I merely took the data as they stood and made the comments that I did on it. I think that certainly we discussed the thing with the Gulf engineers that are behind this, and it is their belief that in the end larger wells will result than is indicated by those tests.

Q Possibly. If the opportunity should present itself, you might be able to look farther into these data, if no other data are available?

A If the Board would desire, I would be only too pleased to do so. I just took the information that was available, that is connected with it, and that is our interpretation of it. I am sorry that there is such a multiplicity of things to be considered that I did not catch this one. I do not think that I would have done anything about it. I just have taken the data as presented.



David G. Hawthorn
Cr. Ex. by Dr. Govier

- 361 -

Q It is sometimes difficult. Well, one other thing in connection with your deliverability for Pendant d'Oreille and the Manyberries field, just those two, you have used open flow figures in approximately the same way as you have used them at Fincher Creek, have you?

A Yes.

Q That you have taken the open flow on the one hand or a calculated open flow from the back pressure tests?

A Yes.

Q One or the other?

A Yes.

Q And you have assumed the slope of 8.5 throughout?

A Yes.

Q Again, Mr. Hawthorn, if any further details are available on the basic data the Board would appreciate having those details filed with it?

A Very well. I will look into that.

Q Thanks very much, Mr. Hawthorn.

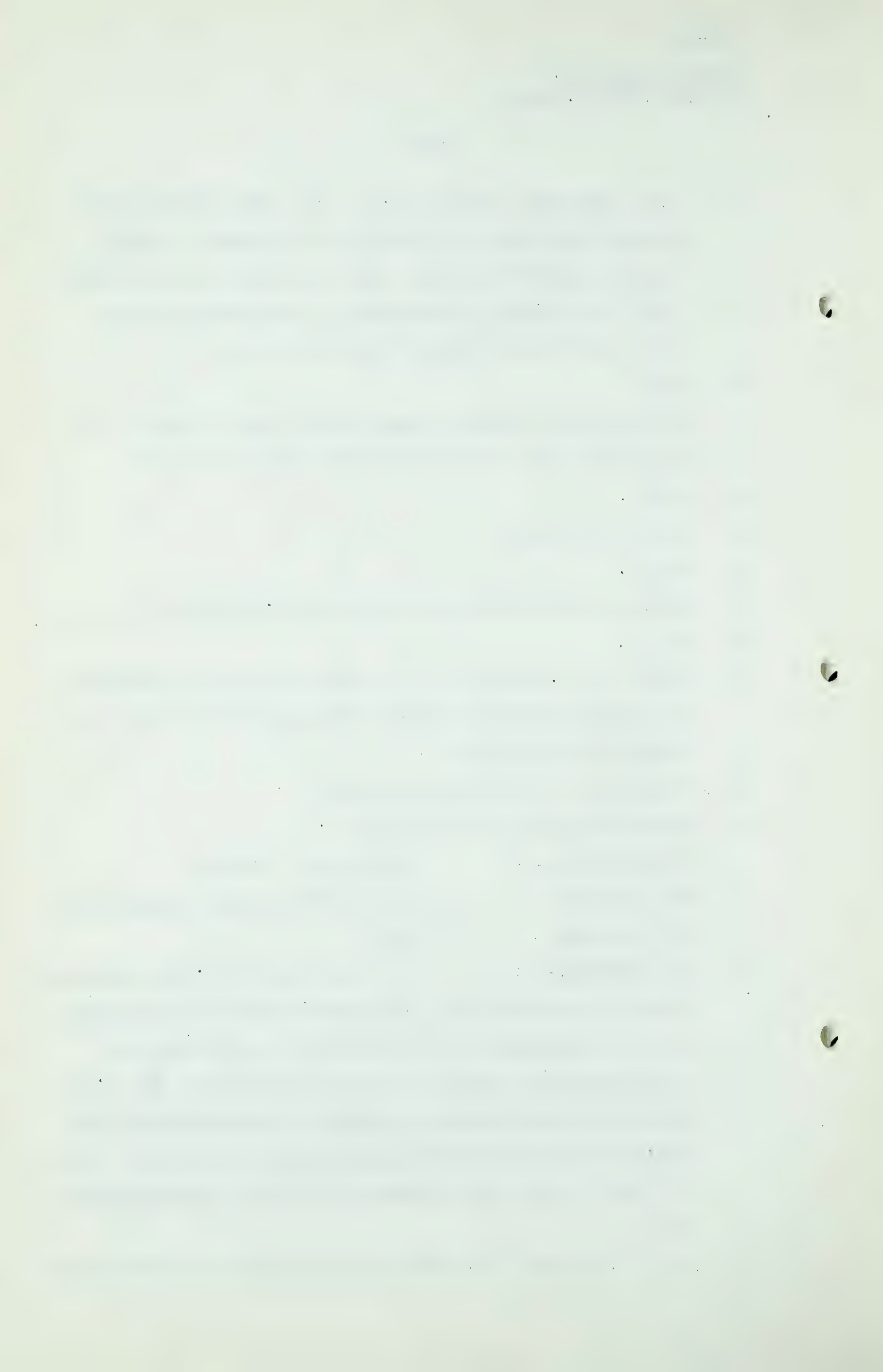
THE CHAIRMAN: That is all, thanks.

MR. MARTLAND: If I might just ask one question.

THE CHAIRMAN: Yes.

Q MR. MARTLAND: Mr. Hawthorn, Dr. Govier yesterday asked a question of Mr. Lewis with regard to the minimum size of fields which can economically be tied into a grid system for a market at various distances. Mr. Lewis said that he was trying to remember a standard which the Tennessee Gas Transmission Company applied in Texas. Were you able to get that information after the hearing yesterday?

A Yes. Dr. Govier, our memories both failed us on that score



David G. Hawthorn,
Cr.Ex. by Dr.Govier

- 362 -

yesterday but we took the opportunity to get in touch with the management of Tennessee, who we know very well, and who had told us of this figure before, and he told us of it again. It is one mile aquare for each ten billion feet of reserve. One mile for each ten billion feet of reserve. And then, incidentally, if we divide our ten hillion by our ten thousand to one ratio, we come back to our one million feet. If you wanted it in terms of daily capacity versus miles, why that would be a quick deduction.

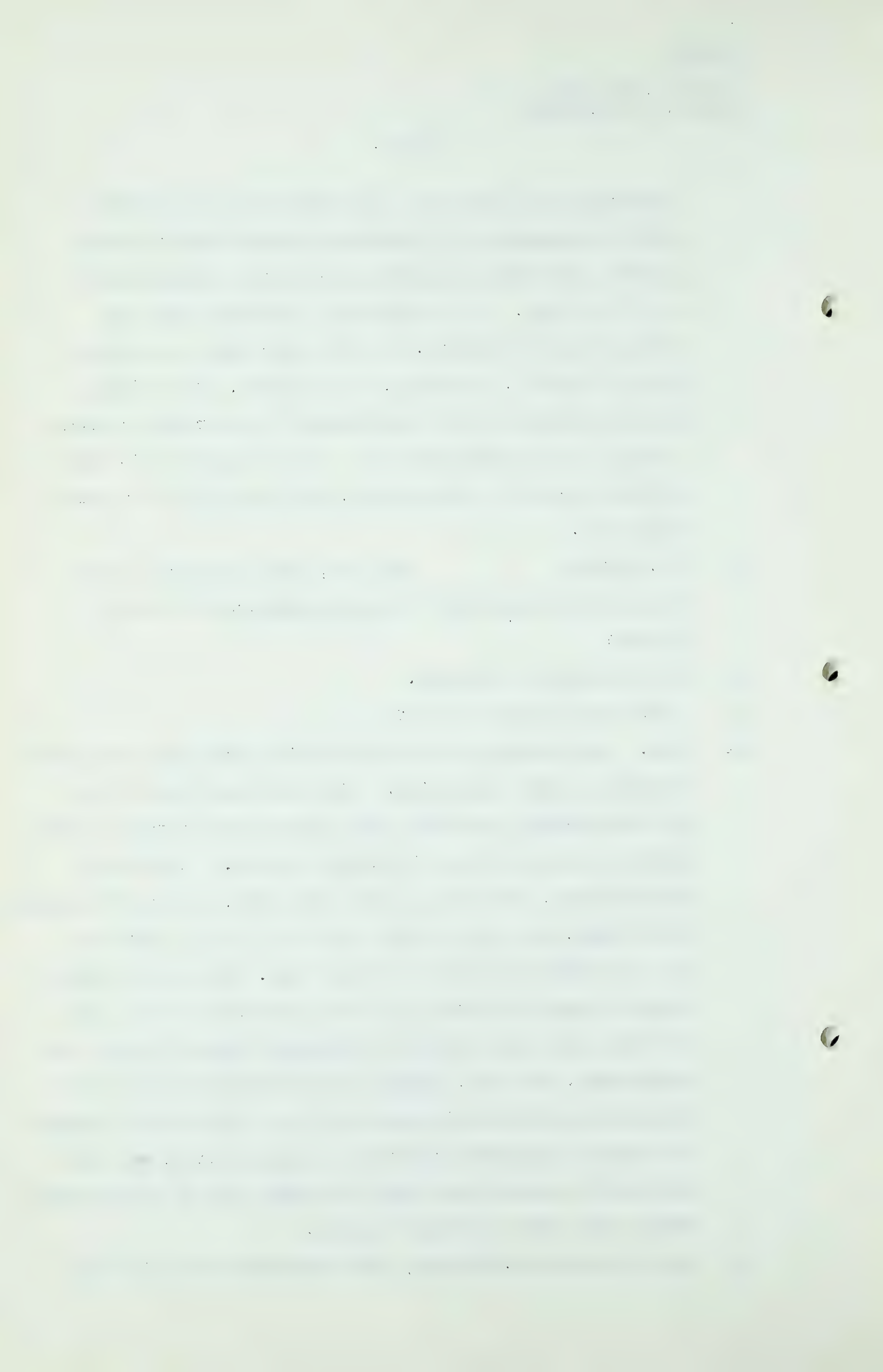
Q DR. GOVIER: That is, that one might expect to get one million feet of deliverable gas tied into a system?

A For each mile of lateral.

Q For each mile of lateral?

A Yes. You understand the Tennessee's problem has been quite serious in this connection. They now number well over 100 gas purchase contracts that extend from northeast Texas down to the area of the Rio Grande Valley. Relatively few of those, probably not more than five, are over 50 million feet a day, and probably not over ten of those contracts are in excess of 10 million feet a day. The rest of them range in that low realm of all the way from 1 to 5 to 10 million feet a day from these individual properties that are contracted. So that, having to decide whether they could step out and offer to lay the laterals to pick up the various and sundry operators' properties or gas reserves, why they have had to devise this short and quick rule of thumb method which they adhere to rather loosely.

Q Do you think, Mr.Hawthorn, that conditions here might be



David G. Hawthorn,
Cr. Ex. by Dr. Govier.
Dr. J.O.G. Sanderson,
Cr. Ex. by Mr. Fenerty - 363 -

sufficiently close to conditions there that a similar rule of thumb might apply?

A I am not **entirely** convinced of that, no. Your reserves are fairly scattered where, I think, possibly each case would have to be considered separately, unless, for instance, there are some areas where a pipe line might go through, and you might use that formula.

Q I do not suppose Tennessee would apply that formula if the distance were very large? Suppose the distance would be 200 miles, would it still apply that rule of thumb?

A Obviously not. I think that is a rather flexible rule that they apply in the case of these small contracts, picking up small reserves and small amounts of daily reserves.

Q Perhaps over ten or fifteen miles, something like that?

A That is right.

Q Thanks very much.

MR. MARTLAND: That is all, thank you, very much.
I will call Dr. Sanderson.

.....

JAMES O. G. SANDERSON (recalled)

already sworn, cross-examined by Mr. Fenerty:

Q Dr. Sanderson, I am going to ask you one question, or perhaps a couple of questions. I attach a great deal of importance to your answers, both because I think it is the gist of this Inquiry and because of your actual experience in this field, and as to your knowledge. The question is this, I am asking you this question, if you were charged with the duty of fully protecting Alberta consumers for, say, thirty years, with a gas supply from economic proven

Dr. J.O.G.Sanderson,
Cr. Ex. by Mr.Fenerty - 364 -

areas in both volume and deliverability, in your opinion what quantity of gas now assured would be available for export and where would it come from? Can you answer that?

A I can give you a partial answer, perhaps. I would like first to condition my answer on this statement, that I have not been charged with the duty of preparing marketable or other types of studies, but to go into the reserves, or reserves of the detailed field. However, your question leads me to one phase of my answer and that is this, that I feel that I must agree with some of the statements that have been made previously by my co-workers to the extent that the gas areas in this Province are so widely ranging and so distantly separated that one must look to some such a thing as a gathering grid system, and if an adequate grid system were established, I think the reserves of gas already known in Alberta are sufficient to quiet your fears as to quantity and deliverability.

Q Are what?

A Are sufficient.

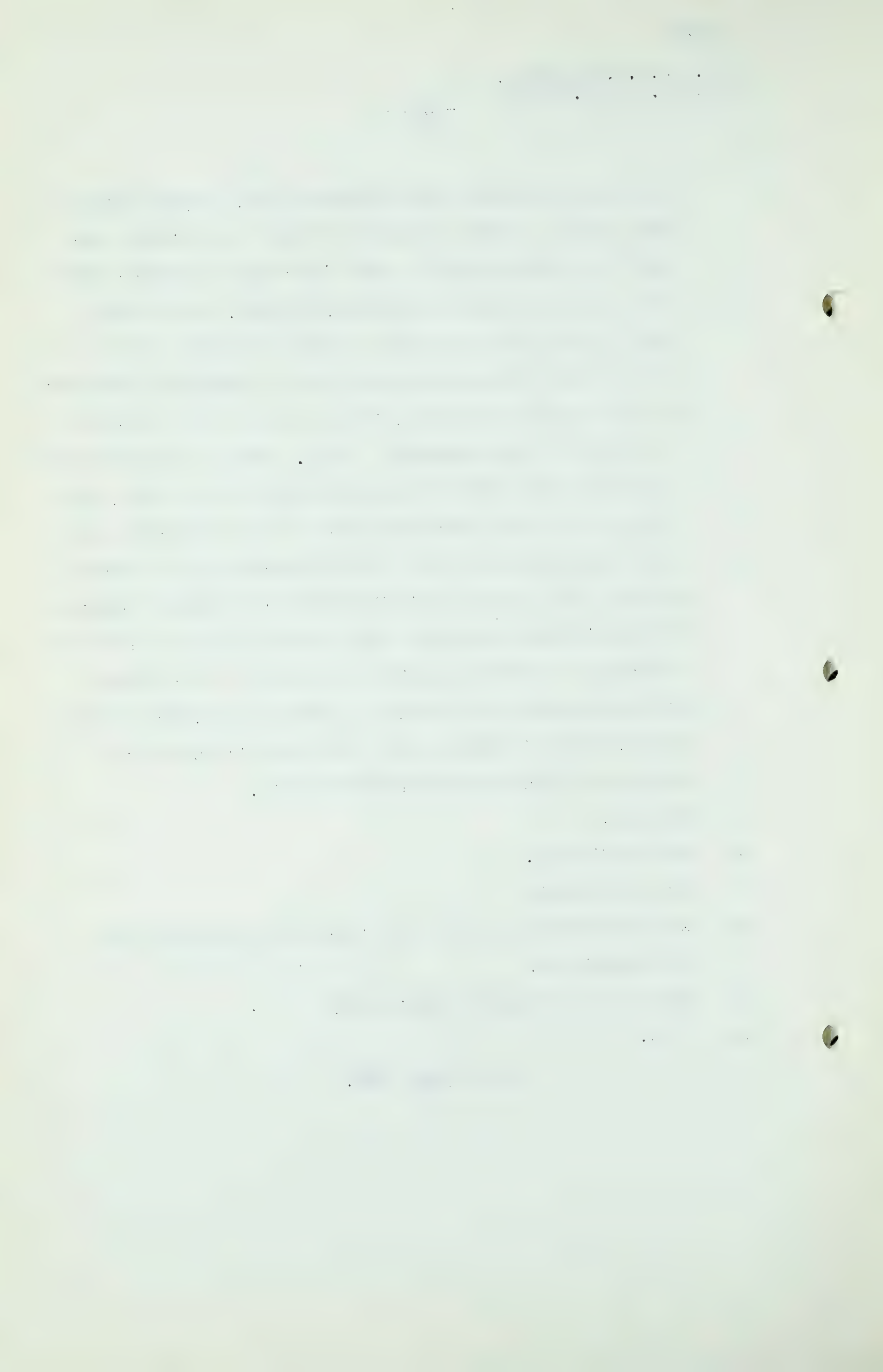
Q Are sufficient?

A Are sufficient to quiet your fears as to quantity and deliverability.

Q Do you think they are sufficient?

A I do.

(Go to page 365).



T-3-1

J. G. Sanderson,
Cr. Ex. by Mr. Fenerty.

- 365 -

Q Yes, and notwithstanding the fact you are not charged with that duty don't you think you can give me an answer to the question?

A You want a study, not an answer. What I would do in the case of handling some 60 or 80 years' supply was one study, and it is something which you could not give in a single small statement.

Q Will you study it and try to give me an answer before this enquiry closes?

A I doubt if I have the time to. I am due in the City of Regina tomorrow morning.

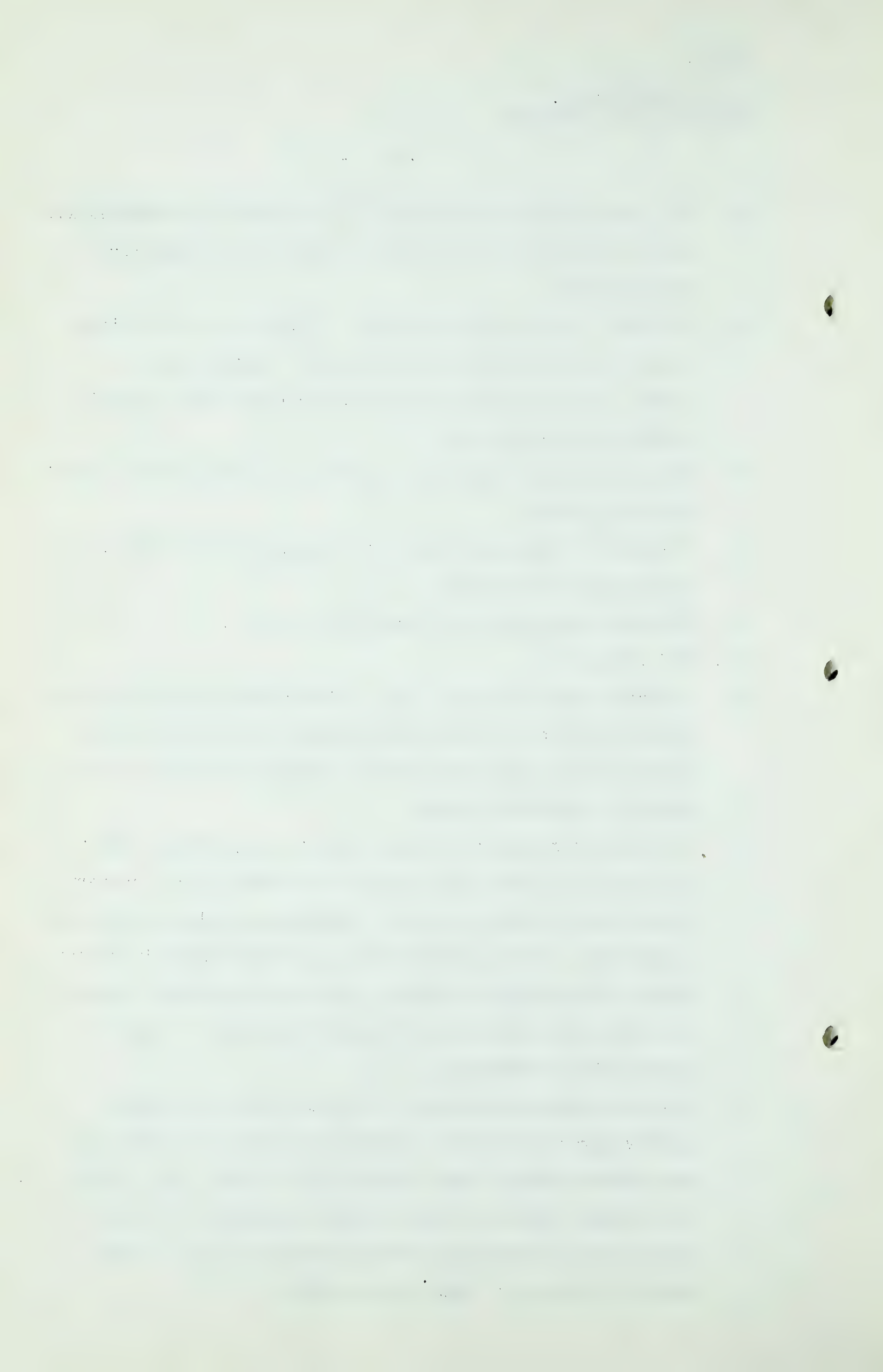
Q You have not given consideration to that?

A No, I have not.

Q I cannot ask you to do a lot of work that you have not had time to do but I thought you perhaps could give me some help, but you cannot give me even what one of the oil men called a dignified guess?

A I thought my question covered that. I just state that my inquiry for the purposes of this hearing was on very broad lines, general lines. Regional geology and regional conditions. It is plainly stated in this Exhibit 6 that there is an adequate amount of gas but it must be gathered and put into practical deliverable condition, I mean in pipe lines or storage.

Q Do you think you can quiet my fears as to the adequate proven gas for internal consumption, both as to quantity and deliverability over a period of 30 years, say? From an economic point of view I thought perhaps you could. Could you find much left over to export? That is what I want to find out. What do you think?



J. G. Sanderson,
Cr. Ex. by Mr. Fenerty.
Ex. by Mr. Goodall.

- 366 -

A As one considers the figures that have been submitted, not only in this submission but in those of other companies, who have done considerable work and especially by the authority in Ottawa, the quantity of gas does not seem to be in question. Deliverability is the critical factor. I believe, looking at the thing strictly as a layman, and more or less an academic geologist, that the main factors of deliverability are adequate facilities.

Q I do not want to embarrass you but at the same time, as I told you, you are on the stand and you are subject to examination. I am going to ask you one more question. Have you formed an opinion and in this be able to quiet our fears of local consumption, that you can show both quantities and deliverability for the 20 year requirement for these pipe lines from proven areas left over. Just your own idea. Do you think you can do it?

A I think so.

Q You really think it can be done?

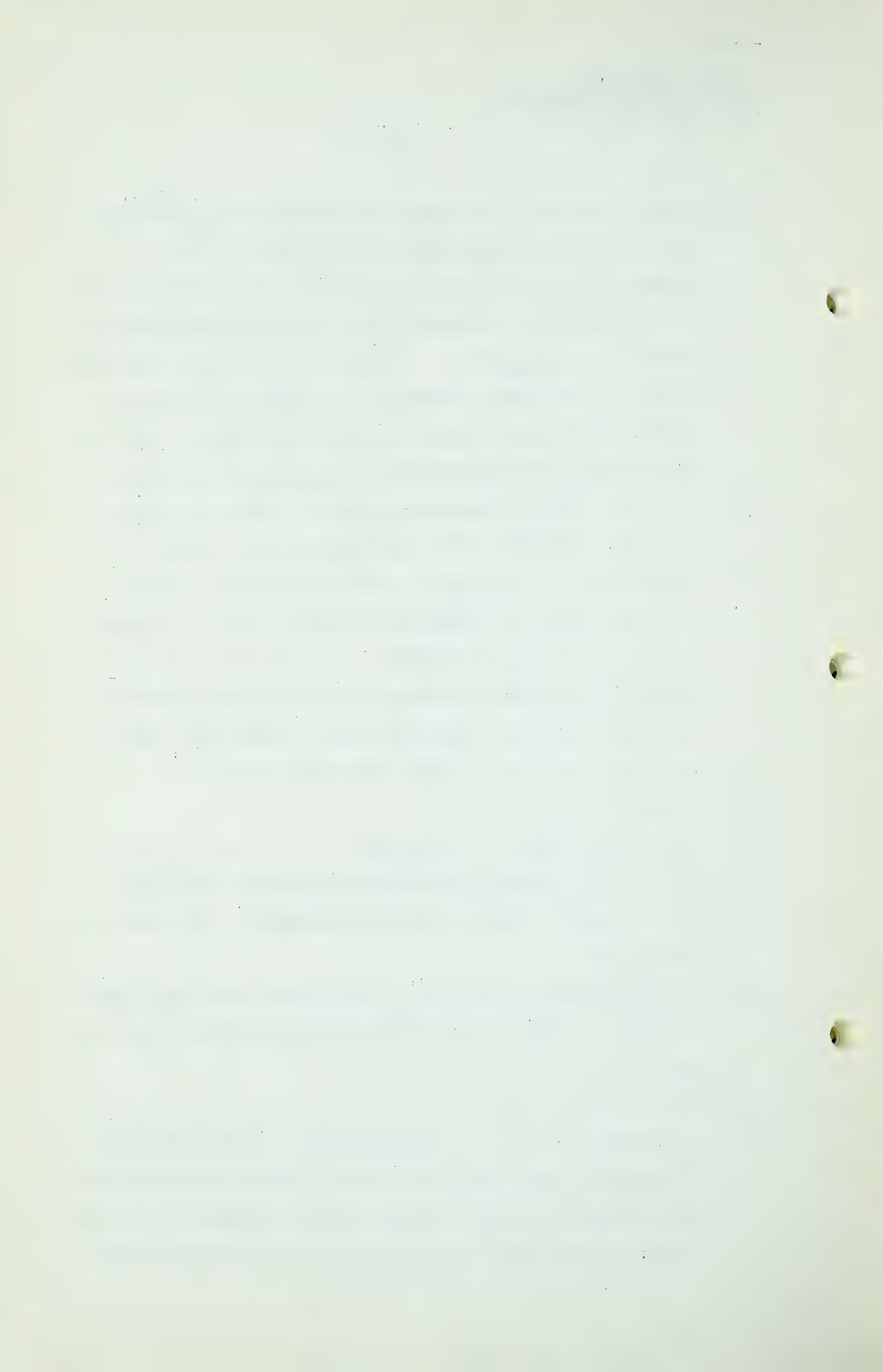
A Yes. I have in mind the Whitelaw discovery and these new discoveries mentioned by Mr. McDonald. They are all significant.

Q I am not going to press it. I notice the Board has stipulated for detail. I just wanted your own general opinion.

A Yes.

Q That is all.

Q MR. GOODALL: Dr. Sanderson, with reference to your mention of the Foothills on page 2, in the second last paragraph of your section on the Foothills Belt, you say: "Although the intense faulting and folding is for



J. G. Sanderson,
Ex. by Mr. Goodall.

- 367 -

"the most part unfavorable for the retention of gas and oil, other discoveries can be expected in the future, but the indications at present do not encourage the hope for a great many more." What would you indicate there as a great many more? Do you mean something comparable with what we already have?

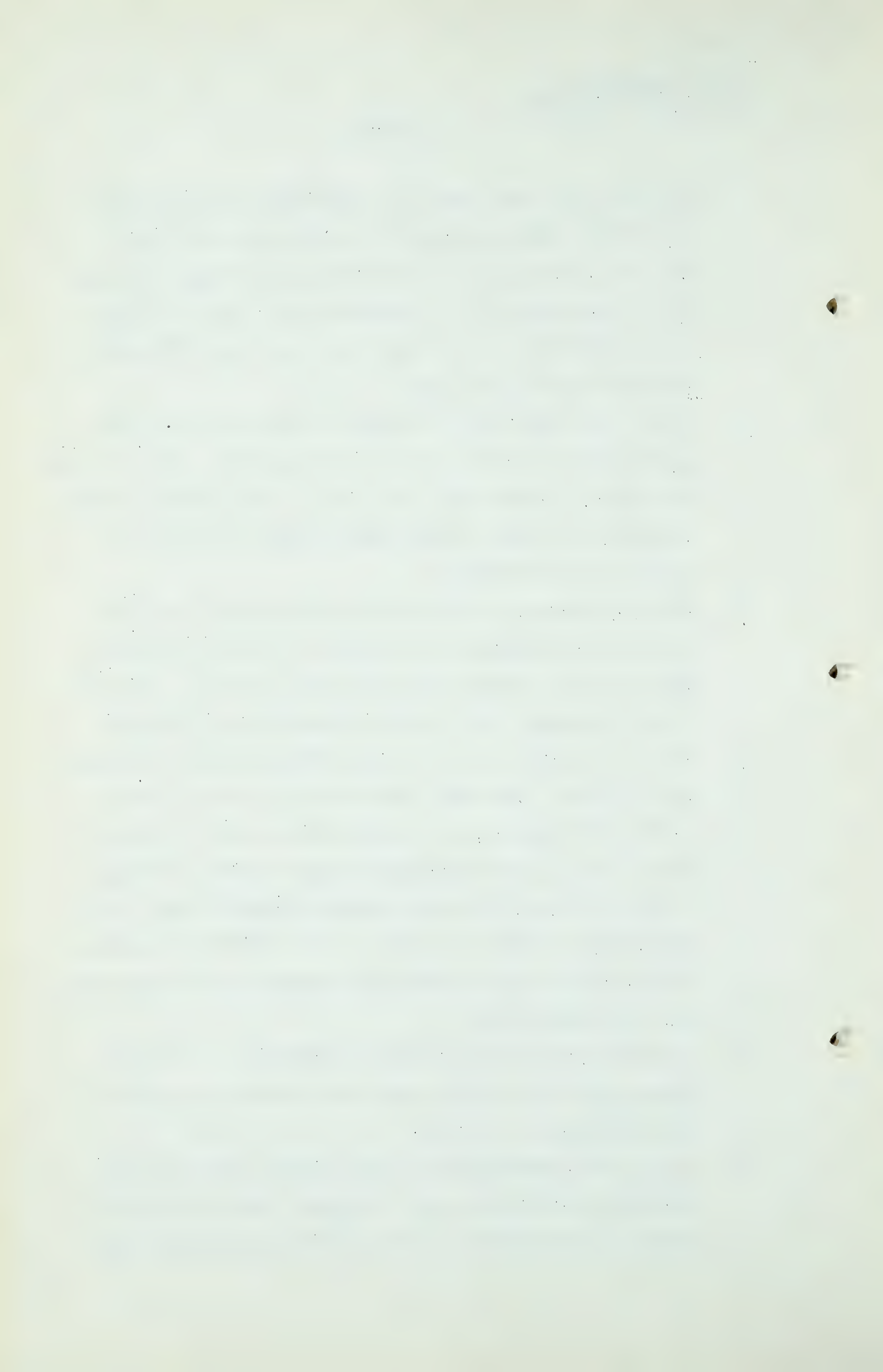
A Yes, I had that figure in mind. We already have three significant fields in the Foothills and when I say "a great many more", I would say 5 or 6 would be a probably fairly optimistic estimate of what further gas fields may be found in the Foothills.

Q We had a previous submission in which there were quite encouraging thoughts on the matter of finding Foothills gas. Do you consider then that the folding and faulting in the Foothills Belt is not favourable for retention?

A Yes. I can give you one or two examples of what prompted that opinion. Beautiful folds such as that at Pekisko Hills, for instance, or the Clearwater uplift and Moose Dome. There is some relatively highly elevated folding there that place it in the elevated limestone area, and apparently allowed the fluid and hydrocarbons to escape, except in some small remaining isolated pockets where they are sometimes found.

Q In your opinion then it would be difficult to discover future reserves, as they are rather scarce on account of the folding and faulting?

A It has been demonstrated, in my opinion, there is considerable difficulty to it. Although some fields that remain to be tested are fairly obvious structures, some



J. G. Sanderson,
Ex. by Mr. Goodall.

- 368 -

as obvious as Turner Valley was. I meant to give a little further assurance to my friend Mr. Fenerty and cite Mr. Slipper's reference to the Brazeau structure of 4 trillion feet, in his estimate. I am inclined to go with him. I am interested in that structure. I think there are other structures much larger than Jumping Pound and larger than Turner Valley that still await the chase after the reefs before they are adequately drilled and tested, and that have, I would say, reasonably good prospects of yielding major gas fields.

Q Do you think pipe lines carrying gas out of the province would encourage development sufficiently that operators would start drilling in the Foothills for gas, for gas structures?

A I believe so, Mr. Goodall.

Q In spite of the risk and the excessive cost?

A There is a question there as to risk. I think if a small detailed study were made of the number of previously located and completed holes in the Foothills that matched against the number of wildcats that have been drilled on the Plains and then compare the result as to gas reserves in the Foothills and the Plains, the risk is no greater in the Foothills. The cost is a little greater, but so are the wells greater as a rule.

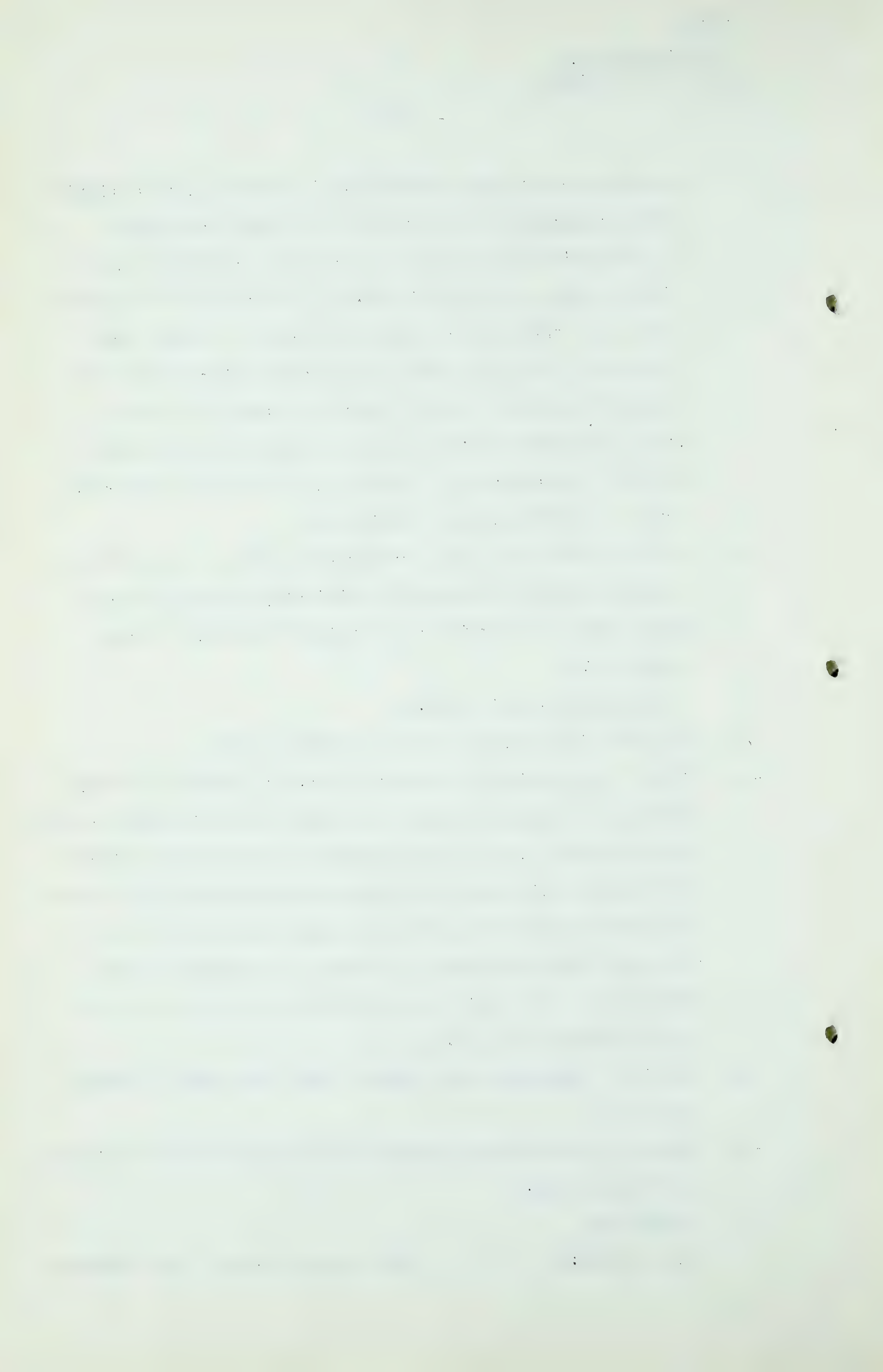
Q That is, comparing the reserves with the number of wells drilled?

A Yes, with the highest reserves being cited in this hearing as Foothills gas.

Q Thank you.

THE CHAIRMAN:

That is all, thanks, Mr. Sanderson.



J. G. Sanderson,
Ex. by Mr. Goodall.
G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 369 -

I think we might adjourn for lunch now.

(At this stage the hearing adjourned until 2 P.M.)

2 P.M. SESSION.

MR. MARTLAND: That evidence up to now, sir, is all the evidence as to reserves which it is proposed to submit at this stage. But this applicant will be considering very carefully the statement made by the Chairman this morning and also the lines indicated by counsel for the Board on cross-examination, and we will propose to do everything we can to submit any evidence which may be of assistance at the joint hearing, including the calling of Mr. Cook, whose name has been mentioned in this evidence.

With that, sir, I propose now to call evidence with regard to the matter of estimated markets and gas requirements, which will be submitted by Mr. Gordon Whitney, whom I will call now. I would like to tender this as Exhibit 8.

ESTIMATED MARKETS AND GAS
REQUIREMENTS OF WESTERN
PIPE LINES NOW MARKED
EXHIBIT 8.

GORDON B. WHITNEY, having been duly sworn, examined by Mr. Martland, testified as follows:-

Q Mr. Whitney, you are associated with Stone & Webster Service Corporation?

A Yes, I am.

Q And that corporation was requested to undertake certain surveys and certain work on behalf of this applicant, Western Pipe Lines, both as to markets and other phases of the proposed work?

G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 370 -

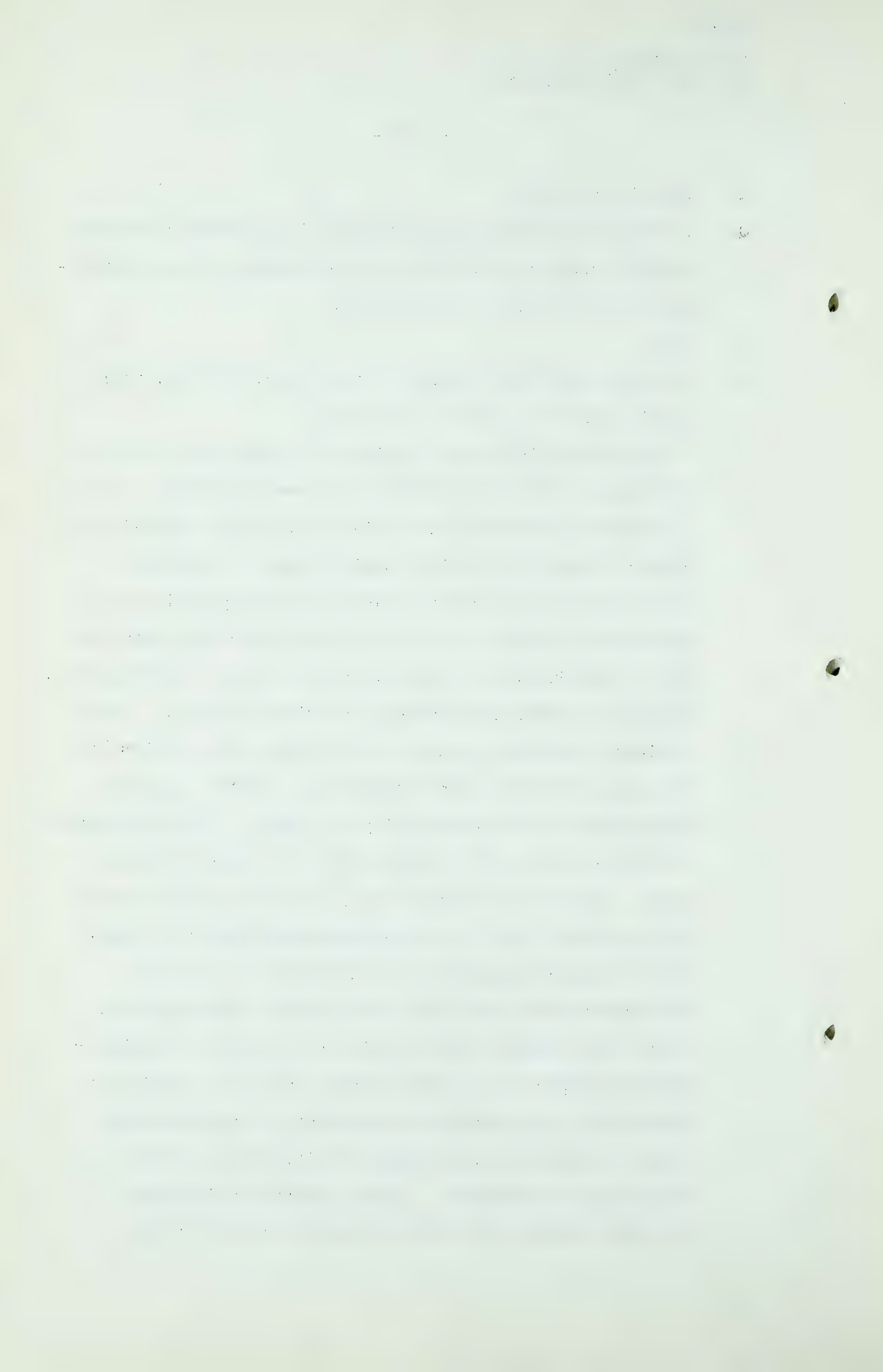
A That is correct.

Q I understand that your particular field was in connection with the matter of marketing and estimates of gas requirements for this applicant company?

A Yes.

Q Would you mind just giving to the Board, briefly, your qualifications in that connection?

A I am employed in the gas engineering department of Stone and Webster Service Corporation of New York City. I am a graduate of Northeastern University, with a Bachelor of Science degree in Chemical Engineering. I attended college on a co-operative plan and my co-operative work assignment during my last two college years was with the Fall River Gas Works Company, in Fall River, Massachusetts, which is a Stone and Webster supervised utility. I was assigned production control and various other duties at the gas plant which were intended to furnish a general background for the gas utility business. After graduation in 1942 I entered the Naval Service for approximately 4 years, during which time I was assigned technical duties in connection with the installation and repair of ship-board ordnance equipment. Upon release, I accepted employment with Conversions and Surveys, Incorporated, which was a newly formed subsidiary of Stone and Webster Service Corporation. This company had been organized to accomplish the mechanical adjustment of gas appliances which is necessary when a gas utility converts from one type of gas to another. I acted as purchasing agent for this company for about a year and a half during



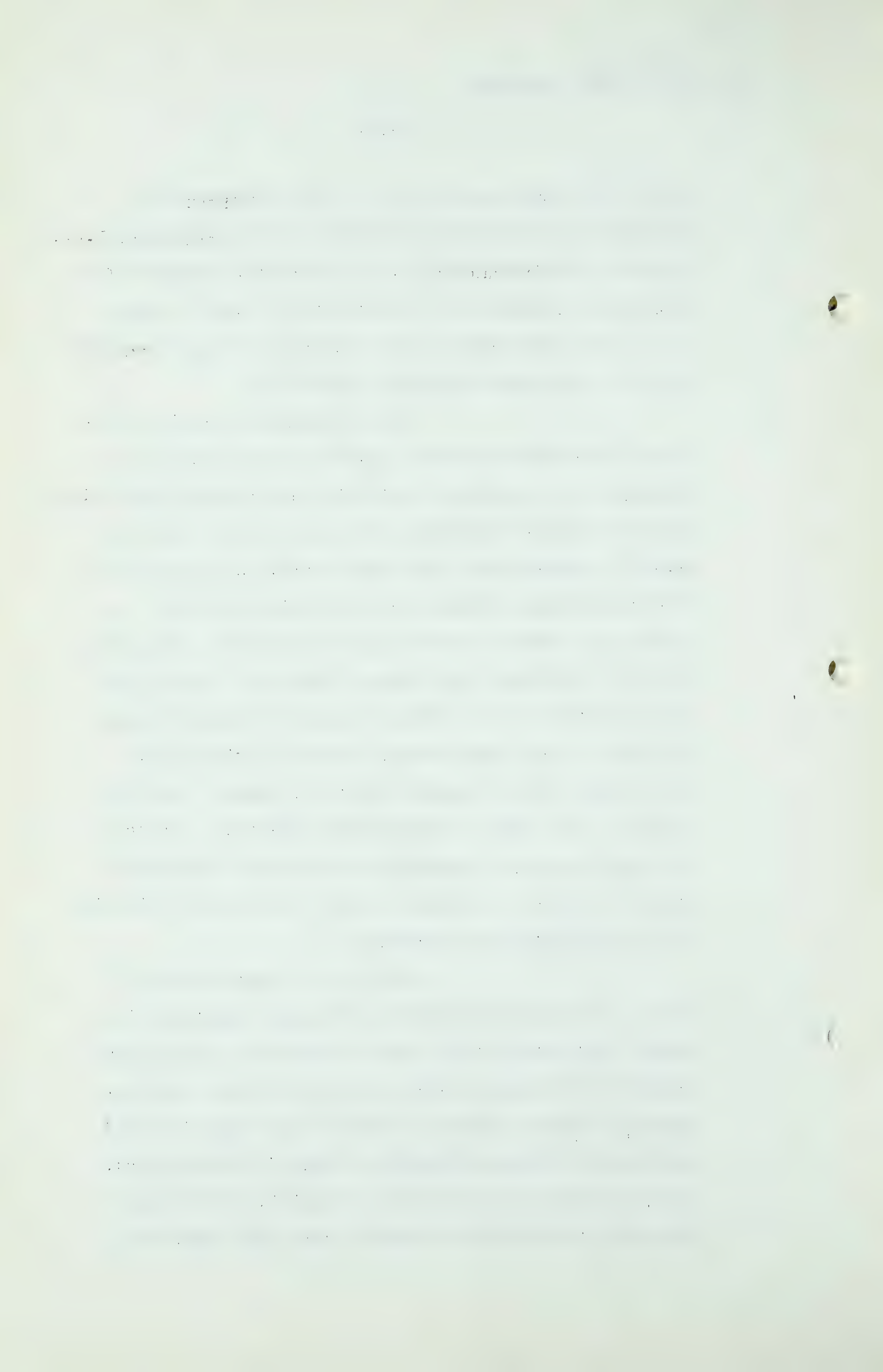
G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 371 -

which time I was responsible for the procurement of materials and tools for conversion jobs in Washington, D.C., Syracuse and Binghamton, N. Y., Rockford, Freeport and Waukeegan, Illinois, and several other smaller places. I was then transferred to the Gas Engineering Department of Stone and Webster Service Corporation.

Stone and Webster Service Corporation furnishes advisory services on all phases of management to a number of utilities and related industries, some on a continuous basis and others on the basis of specific assignments. In recent years, the company has been furnishing advisory and engineering services to an increasing number of natural gas transmission companies. For these services, the company maintains a large staff of specialists in the various phases of utility management such as gas engineering, electric engineering, accounting, rates, corporate matters, taxes, insurance, finance, etc. The gas engineering department conducts the engineering and operational studies in connection with the services furnished to gas distributing utilities and gas transmission companies.

One of the primary phases of nearly all studies conducted by the gas department is a market projection of one sort or another. I have been assigned to the market phase of many of these studies. Among the market studies in which I have been involved are Central Illinois Electric and Gas Co. of Rockford, Ill., Fall River Gas Works Co., Virginia Electric and Power Co. in Norfolk and Newport News, Lake Shore Gas



G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 372 -

Co., Ashtabula, Ohio, Allied New Hampshire Gas Co., Portsmouth, N.H., New York & Richmond Gas Co., Staten Island, Western Kentucky Gas Co., Owensboro, Ky., and La Clede Gas Light Co., St. Louis. We were recently engaged by Michigan-Wisconsin to review the load estimates of their customer companies and I was assigned to much of the work of this study.

Q This document which has just been filed as an Exhibit, Mr. Whitney, "Estimated Markets and Gas Requirements of Western Pipe Lines," did you prepare that?

A Yes, I did.

Q As a result of the work and surveys that you have made?

A Yes.

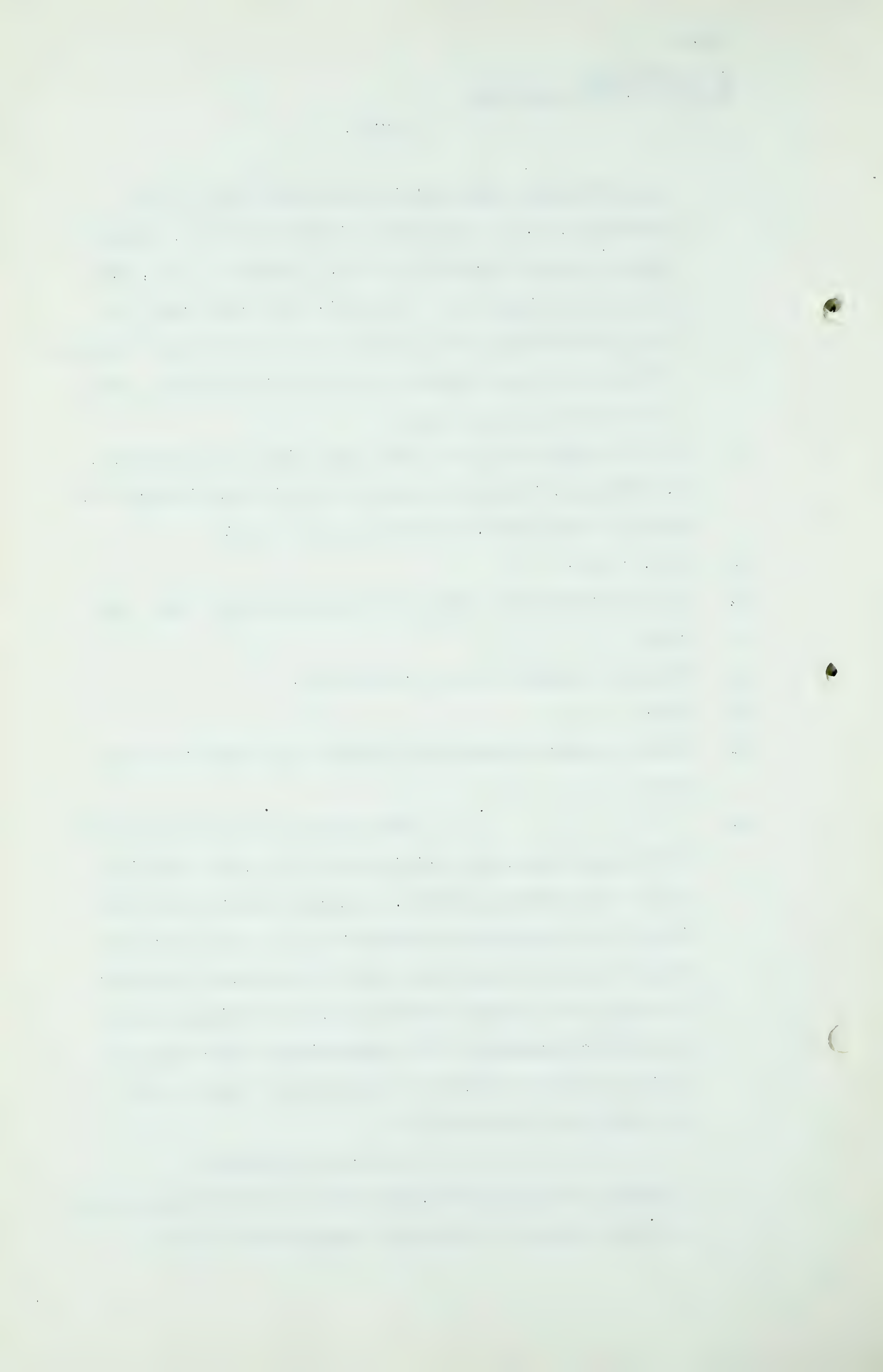
Q You were engaged on that personally?

A Yes.

Q Would you mind commencing reading that exhibit to the Board.

A The proposed transmission system of Western Pipe Lines originates in the gas producing fields of southern Alberta, traverses the Prairie Provinces in an easterly direction to serve the centres of Saskatchewan and Manitoba, and then proceeds southward to supply the heavily industrialized and mining areas of northern Minnesota. The approximate route and the cities to which service is proposed are shown on the map attached as Appendix 1.

The area encompasses a population totalling 782,000 people. The municipalities to which service is initially proposed and their



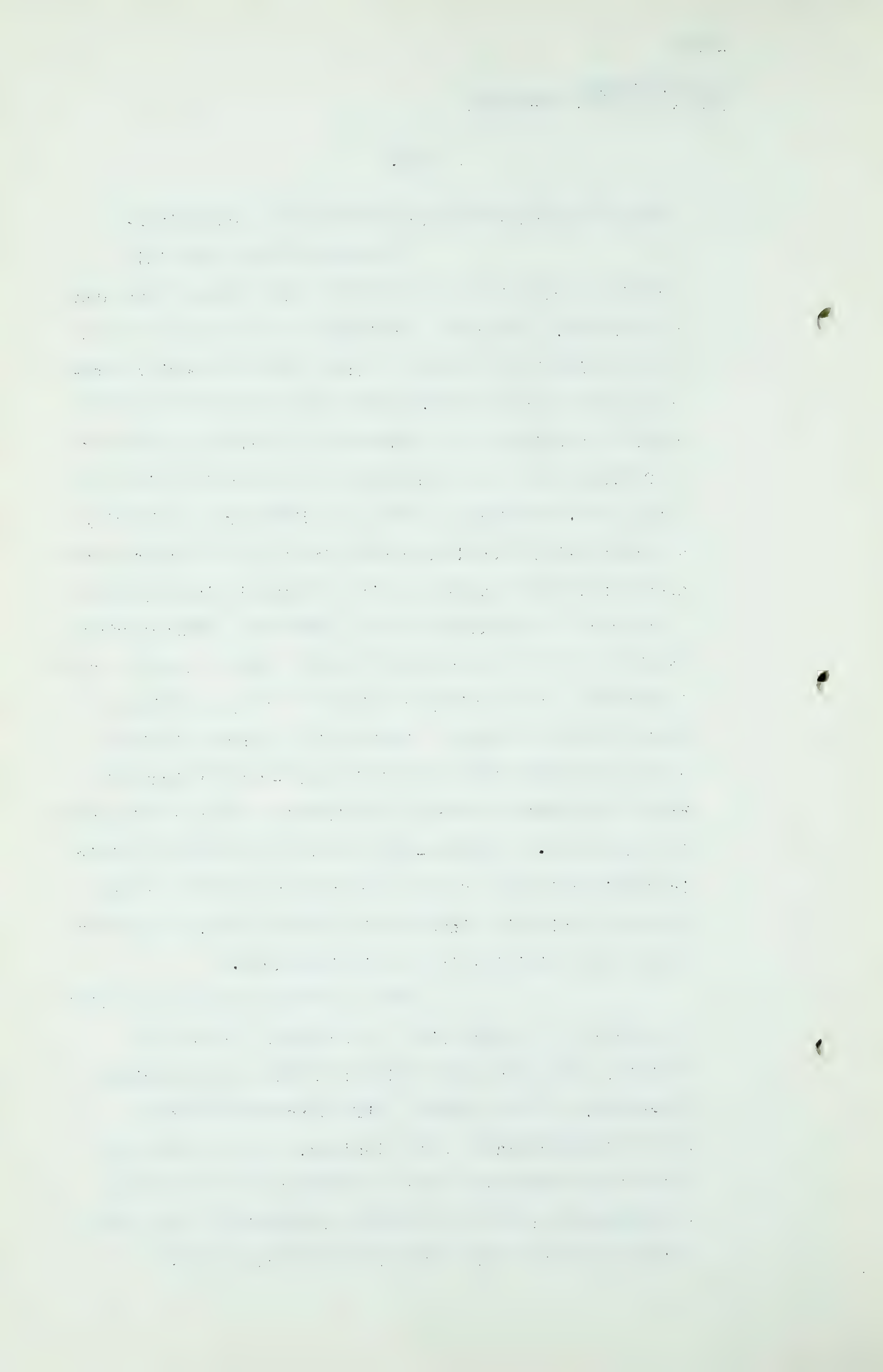
G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 373 -

respective populations are tabulated in Appendix 2.

The bulk of the potential Canadian market is concentrated in the metropolitan area of Winnipeg, Manitoba. Winnipeg is the largest city on the Canadian Prairies and is also the most heavily populated area on the proposed pipe line system. The 1946 census establishes the population of corporate Winnipeg at 229,045 and the metropolitan area which includes the city of St. Boniface at 307,494. Winnipeg is primarily a commercial and trading centre for the vast agricultural areas of Western Canada and its economy is largely based on service to the agricultural industry. Manufacturing has been on the increase, but other than the local service industries, it is mainly confined to the processing of agricultural products. Winnipeg is a large shipping centre through which most of the east-west freight of both the Canadian National and Canadian Pacific Railroads is channelled. The make-up yard of the Canadian Pacific in Winnipeg is one of the largest in the world. Both railroads maintain sizable maintenance shops, warehouses and other facilities in the Winnipeg area.

Other Canadian cities which will be served by the pipe line are Brandon, Portage la Prairie, Transcona and Selkirk in Manitoba and Regina, Saskatoon, Prince Alberta, Swift Current and Moose Jaw in Saskatchewan. Like Winnipeg, these cities are primarily commercial centres serving the surrounding agricultural areas, and whatever industries there are exist mainly for the fulfillment of local needs.



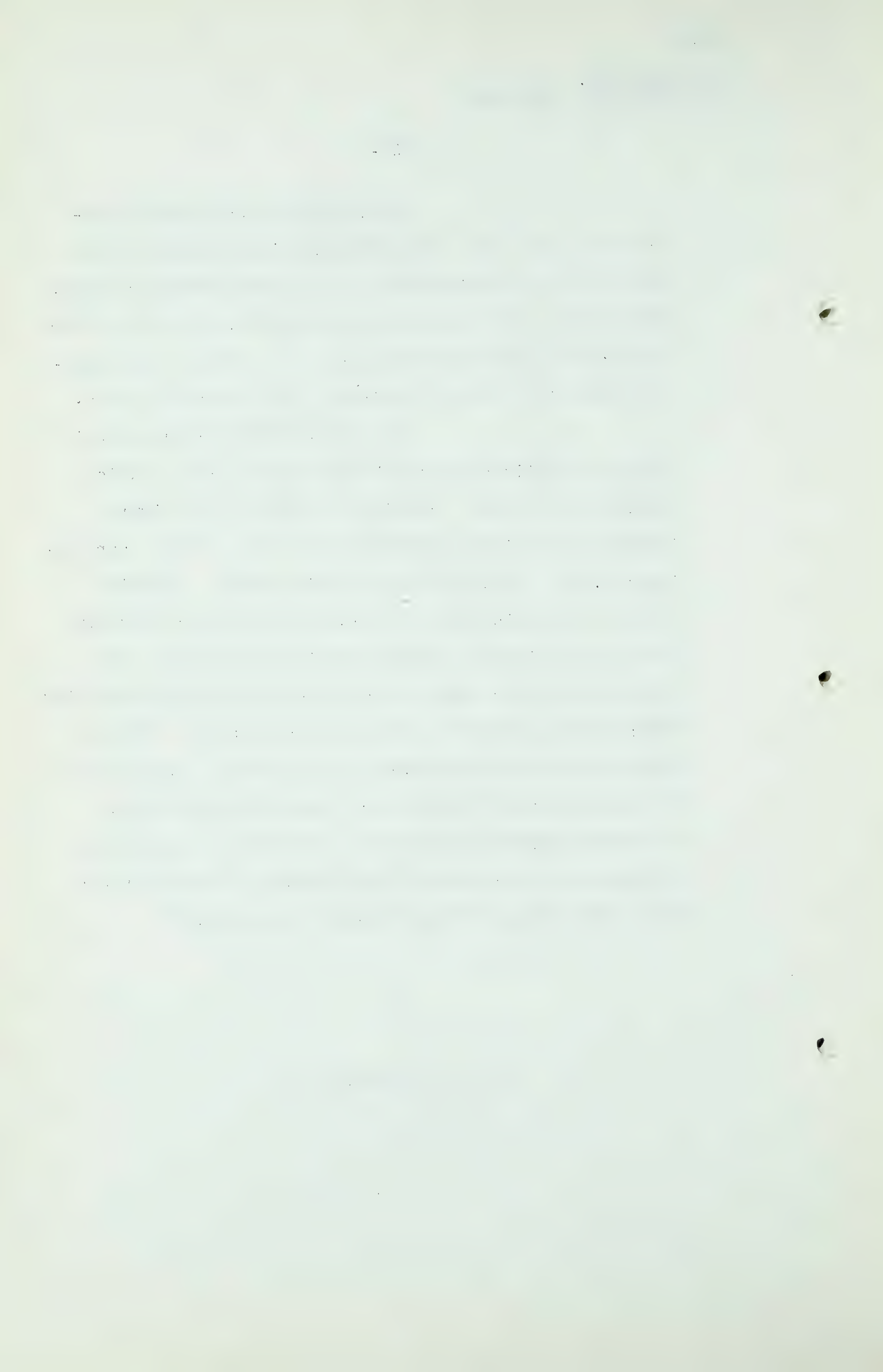
G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 374 -

It is further proposed to construct the pipe line south from Winnipeg through the Red River Valley rendering services to Grand Forks and Fargo, North Dakota, and Crookston and Moorhead, Minnesota. From this area the main line would run in a more or less easterly direction terminating in the Duluth-Superior area.

The Duluth-Superior District is the most heavily populated United States area to which service is proposed. Preliminary 1950 census figures indicate a combined population of the two cities approaching 140,000. This district is principally a shipping centre. The twin ports of Duluth and Superior annually handle some eighty to ninety million tons of iron ore from the Superior District en route to the steel producing centres at the eastern end of the Great Lakes. There is also a considerable movement of coal which is brought up the lakes on the returning ore boats and distributed throughout northern Minnesota. In addition to the ore business, the ports handle huge volumes of grain on the way to the eastern milling centres and markets.

(Go to page 375)



G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 375 -

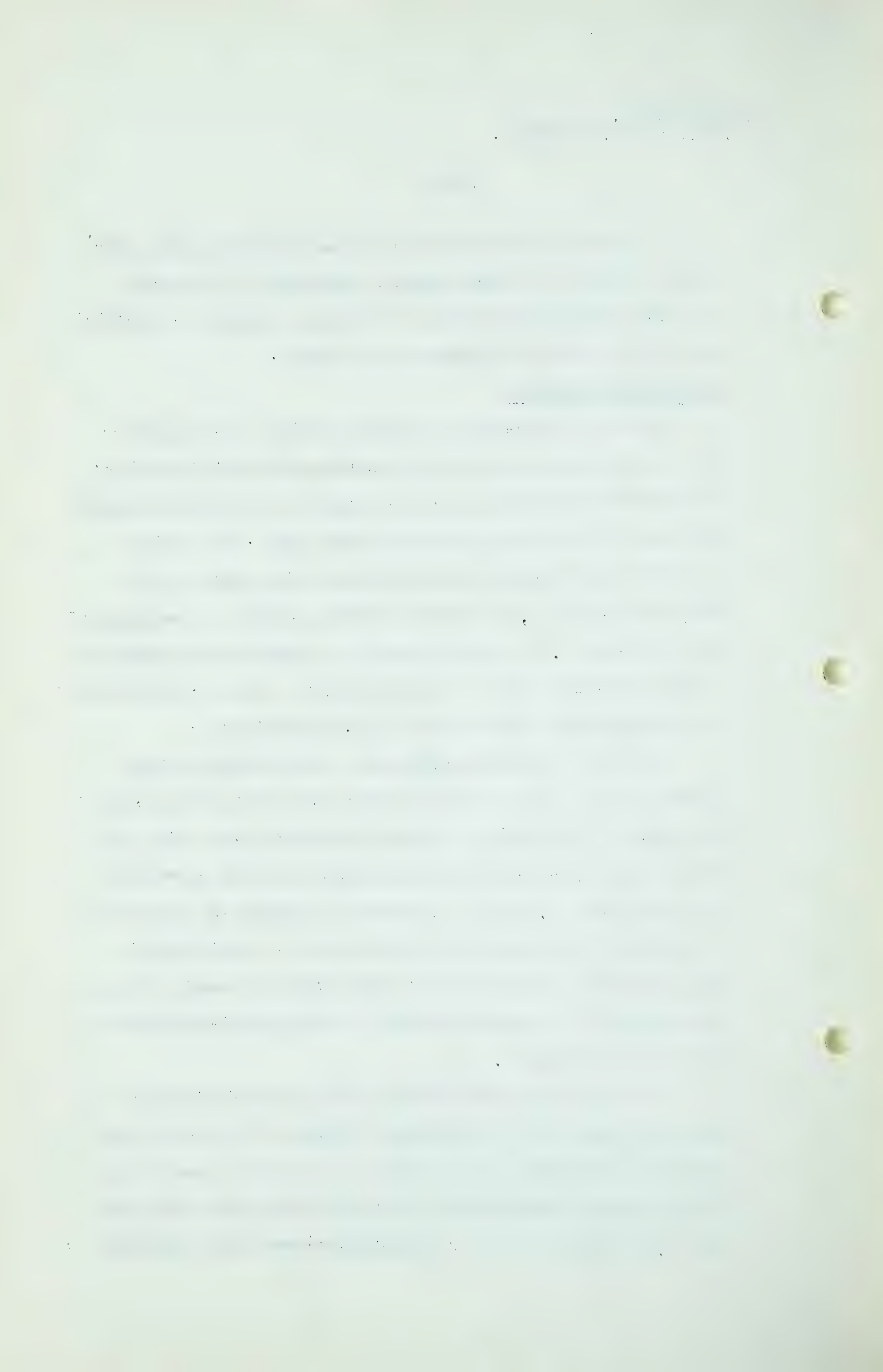
A lateral line which will connect with the main line in the vicinity of Grand Rapids, Minnesota, is proposed to serve the municipalities of Hibbing, Virginia, Chisholm and Eveleth along the Mesabi Iron Range.

Present Gas Service

The only operating gas utility within the Canadian area is the gas system of the Winnipeg Electric Company. This system distributes coke-oven gas to a relatively small portion of the Winnipeg metropolitan area. The present distribution requires the operation of the plant at its maximum capacity, and for this reason, sales are necessarily curtailed. It is not feasible to expand the operations of the coke-oven plant at today's price levels. At present the company only serves about 15,000 customers.

The city of Brandon, Manitoba, until 1949, had gas service from a small coal gas plant, but the system, which was owned by the Manitoba Power Commission, has been withdrawn from service and all customers have been converted to electricity. It will, therefore, probably be necessary to construct a new system in this city. As there are no gas systems at present in the other Canadian areas, it will be necessary to construct complete distribution systems to serve these cities.

In all of the United States areas to which service is proposed, there are existing gas systems. Both Duluth and Superior, which make up the bulk of the retail load in the United States, have gas systems which distribute coke-oven gas. The Duluth system is municipally owned and operated,



G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 376 -

and its coverage of the service area is unusually complete. The city claims to have the lowest manufactured gas rates of any city in the United States. The gas business in Superior is conducted by the Superior Water, Light and Power Company, which is the Wisconsin subsidiary of the Minnesota Power and Light Company. The Superior system likewise has good coverage of its service area and rates are very low relative to other privately owned manufactured gas distribution systems. Both Duluth and Superior purchase their coke-oven gas from the Interlake Iron Corporation, which operates a coke-oven plant in Duluth. In the past few years, the demand for space heating gas in the two cities has far exceeded the capacity of the coke-oven plant. The coke-oven operators have increased their plant capacity to meet base load growth, but they have not felt justified in constructing capacity for space heating service. Because of the limited capacity, space heating restrictions have been in effect in both cities for several years.

Along the Mesabi range, the towns of Hibbing and Virginia have municipally owned and operated gas systems which cover nearly all of the areas within their respective city limits and which serve gas at reasonable rates. Chisholm and Eveleth are served by the distribution systems of the Northwest Gas and Power Company, and in these two towns, coverage is not as good as in the towns with municipal operation. Almost all of the inhabitants of the Mesabi range municipalities are engaged in one way or another in the mining of iron ore, and their economy is completely

G. B. Whitney,
Dir. Ex. by Mr. Martland.

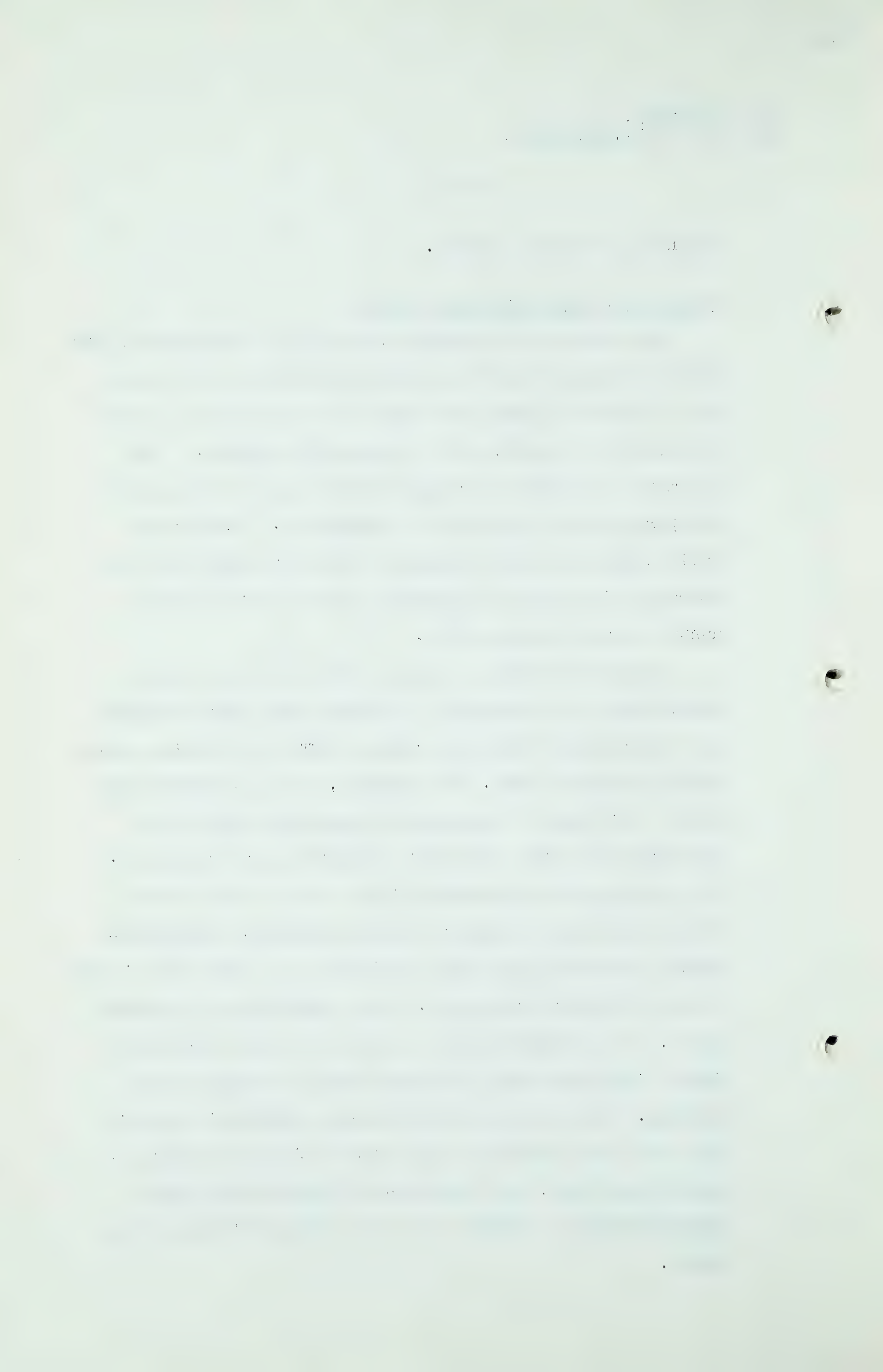
- 377 -

dependent on that industry.

Residential and Commercial Markets

The number of customers which will be connected by the various distribution systems and the peak day and annual use of these customers have been estimated for the first five years of operation of the pipe line system. The estimated customers by classes at the end of five years of operation are tabulated in Appendix 3. The maximum daily demand of these customers during the fifth year of operation is shown in Appendix 4 and the corresponding annual demand in Appendix 5.

Population trends in each of the areas have been studied and the residential customers have been estimated as a percentage of the anticipated number of dwelling units during any given year. For example, it is estimated that by the fifth year of operation in Winnipeg 55% of the dwelling units will represent residential gas customers. The corresponding percentage figure for the other areas varies from 48% in Brandon to 88% in Duluth. Residential heating customers have been projected as a percentage of the total residential customers. Using Winnipeg as an example again, it is estimated that by the end of the fifth year 40% of the residential customers will be using gas for heating. The unit use of residential customers for each area has been estimated on the basis of present sales of manufactured gas, the experience of other natural gas companies and on judgment as to the effect of competitive fuels.



G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 378 -

Commercial customers have been related to residential customers in ratios varying from one to ten in most Canadian cities to one to twenty in some of the Mesabi Range communities. As in the residential classification, customer usage has been based on experience of other natural gas utilities with consideration being given to the competitive fuel situation.

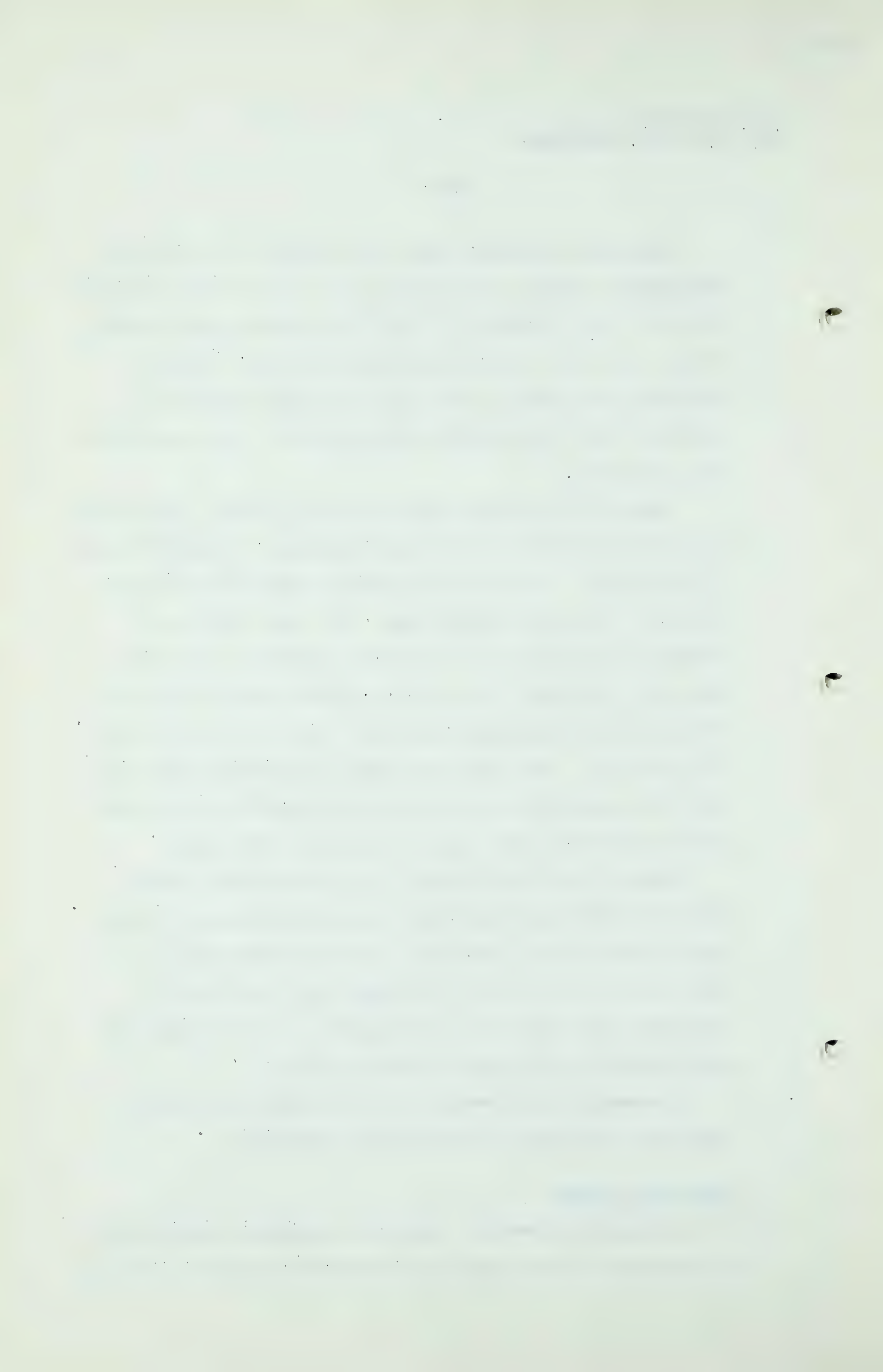
Inasmuch as a large portion of the potential residential and commercial market is for space heating, a detailed study of the weather in the various service areas was necessary in order to determine peak loads. All peak loads were estimated on the basis of the average minimum mean temperature for the period 1941 - 1950, rather than on the basis of the lowest mean temperature that has ever been recorded. In other words, the peaks represent the maximum loads which are to be expected in an average year rather than the loads which would occur under the most extreme conditions.

Weather data was obtained from the Canadian Meteorological Service and from the United States Weather Bureau. Weather data was not available for every municipality to which service is proposed, but where such data was not available for a particular municipality, that municipality was referred to the nearest weather station.

A summary of the weather data utilized in preparing these load estimates is attached as Appendix 7.

Industrial Market

A complete survey of industrial customers was made for the purpose of establishing the potential industrial natural



G. B. Whitney,
Dir. Ex. by Mr. Martland.

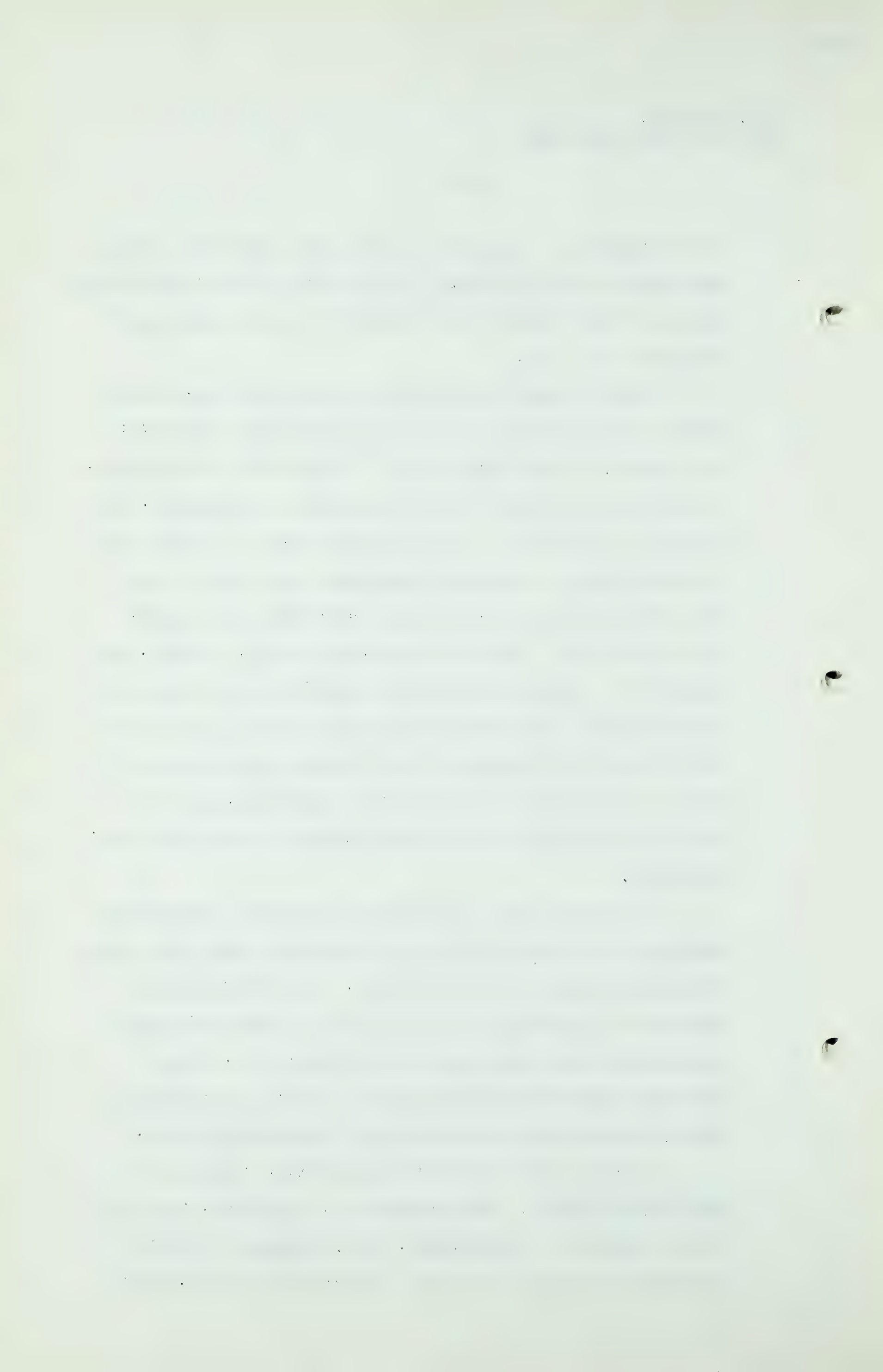
- 379 -

gas consumption. The potential for the industrial sale of gas depends almost entirely on the price of the competitive fuels and these prices vary widely at various locations along the pipe line.

In Saskatchewan and Manitoba, high grade fuels such as oil and good grades of coal are relatively expensive; but lignite, a lower grade fuel, is relatively inexpensive, is quite satisfactory for use in modern installations, and is readily available. It is expected that no trouble will be experienced in replacing high grade coal and oil for such processes as heat-treating, malt-drying and cement kiln operations. The market for boiler fuel, however, will probably be competitive, and the quantity of gas which will be consumed by this market will depend on the location of the customer with respect to the lignite mines, the load factor of the customer's industrial operation, and the relative efficiencies of gas and lignite in the particular operation.

In Winnipeg, one of the largest potential industrial customers is a cement plant which currently uses high grade and comparatively high priced coal. The railroad shops represent a potential industrial load for some of their higher grade uses where gas would replace oil. Other potential industrial gas consumers include a malt-drying plant, a lime plant and three steel fabricating shops.

In Brandon, the industrial potential, consists of a meat-packing plant, a few creameries, laundries, and other local industries. In Selkirk, the principal potential industrial customer is a large steel-rolling mill, which



G. B. Whitney,
Dir. Ex. by Mr. Martland.

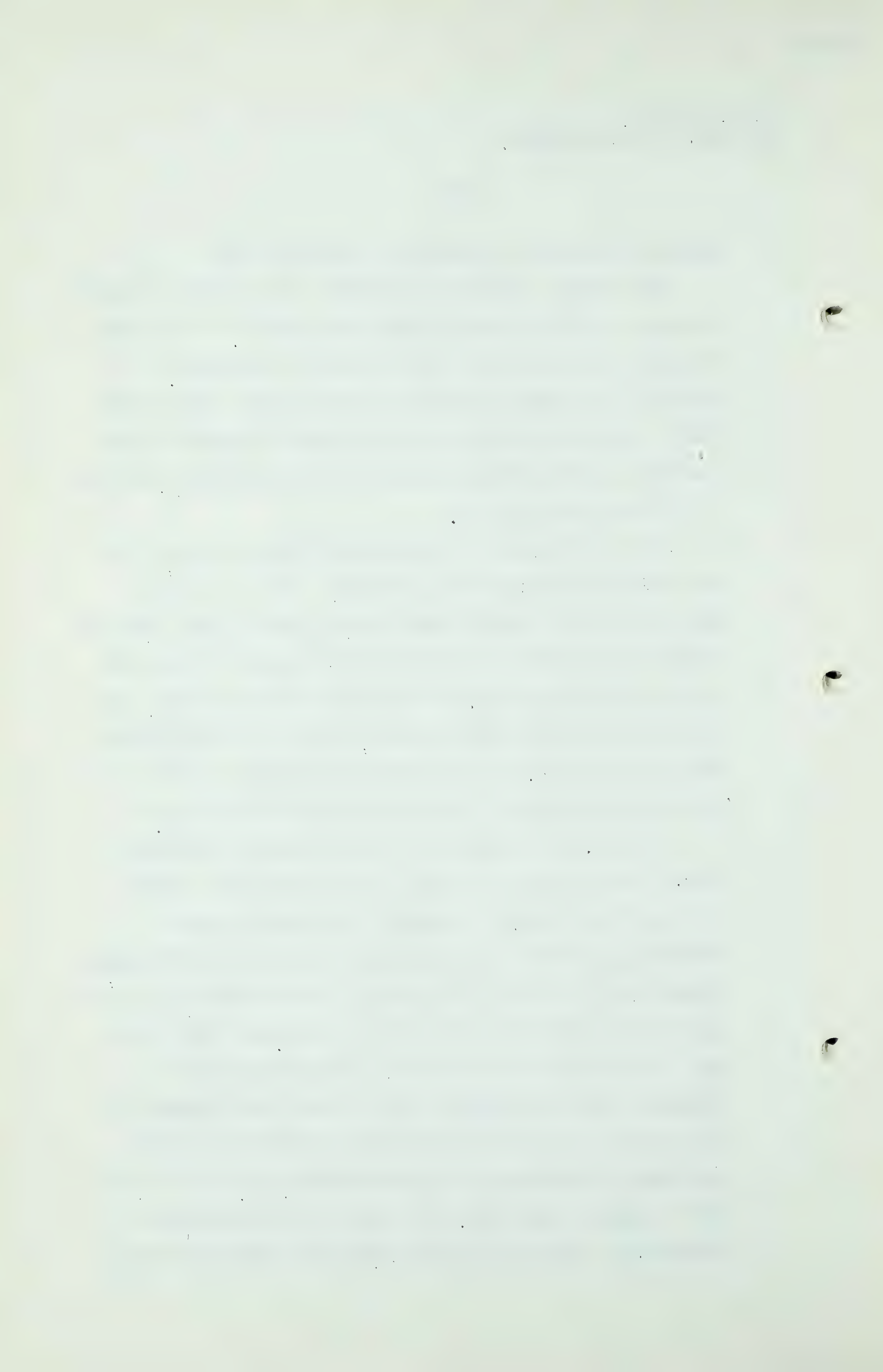
- 380 -

presently consumes substantial volumes of oil.

The largest industrial customer for firm gas in Saskatchewan is Saskatchewan Minerals at Chaplin. This plant is owned and operated by the Provincial Government. In addition, the steam generating plants of the Saskatchewan Power Corporation at Saskatoon and Prince Albert and the municipal power plant at Regina are all excellent prospects for off-peak sales of gas.

At the western end of the United States system, the principal industrial fuel is lignite. In the Duluth-Superior and the Mesabi Range areas, eastern coal which is brought in through the docks at Duluth supplies the bulk of the industrial energy. The lowest priced eastern coal is of course found right in Duluth, but it is anticipated that even in Duluth, gas will be competitive if the industrial application is of sufficiently high load factor.

In Duluth, although the city is largely a shipping center, there are some sizable industries which consume fuel in large volumes. Probably the largest single industrial consumer is the American Steel and Wire Company, a subsidiary of the United States Steel Corporation, which operates a diversified steel mill in Duluth. This plant has its own coke-ovens producing coke for the blast furnaces. It is estimated that the fuel requirements of this plant over and above their own production of coke-oven gas are equivalent to approximately 13,000,000 cubic feet of natural gas per day. The United States Steel Corporation, through its subsidiary, the Universal Atlas

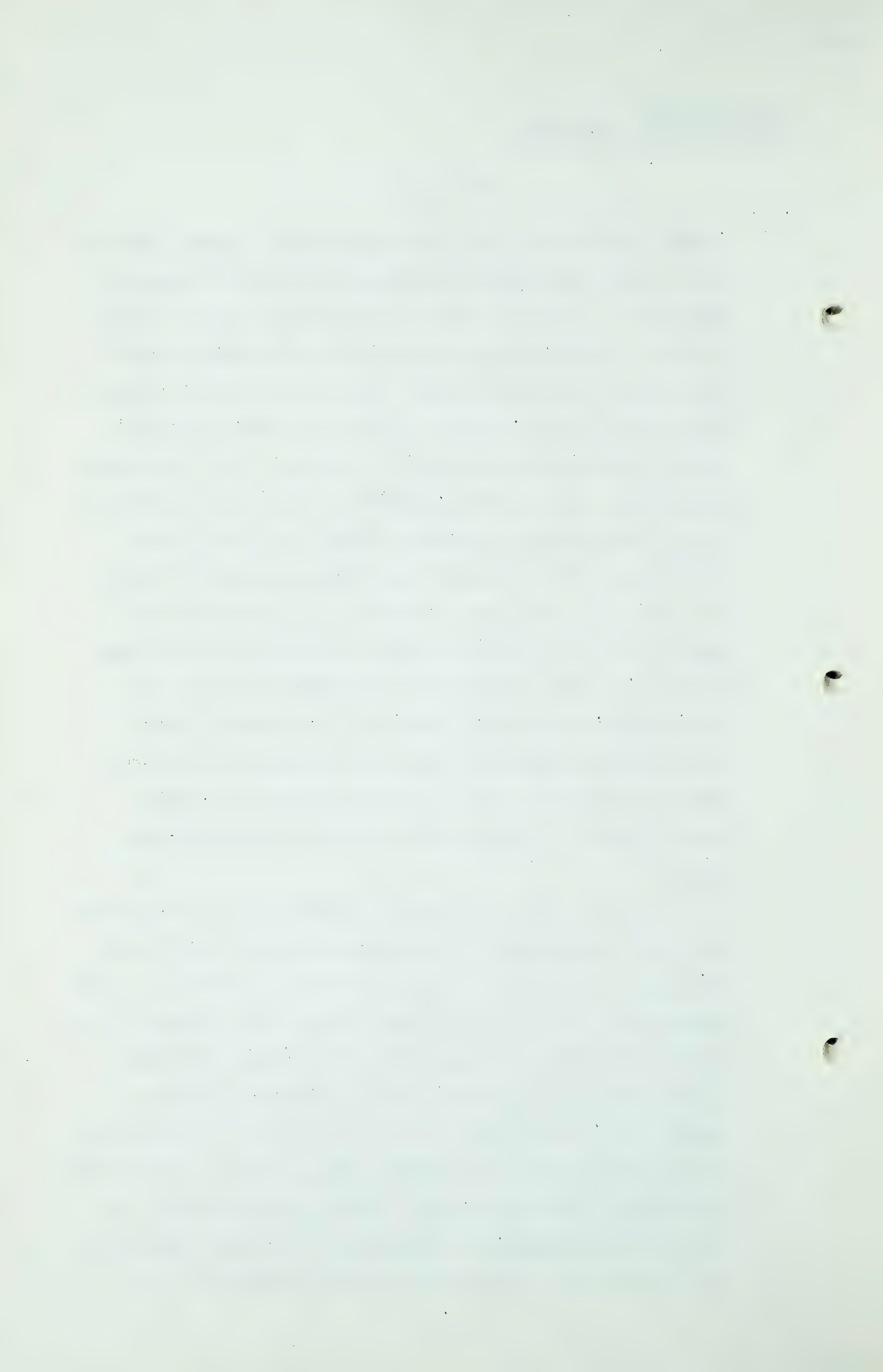


G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 381 -

Cement Corporation, also operates a sizable cement plant in Duluth, in whose kilns a substantial quantity of natural gas could be utilized. Both the steel mill and the cement plant are around-the-clock operations and would be high load factor consumers of gas. There are in Duluth and the neighboring city of Cloquet, some large wood processing plants which utilize substantial volumes of fuel for steam generation. These plants manufacture a variety of products ranging from high grade paper to wall-board and pressed fiber board. There is some milk processing carried on in the area which, of course, requires heat. The fuel consumption of the individual plants is relatively small when compared to some of the other industrial customers, but the aggregate volume will amount to a worthwhile load. Other smaller industries which are potential customers for varying quantities of gas include a refrigerator plant, some breweries, a meat-packing house, and some railroad shops.

One of the most interesting possibilities in connection with the United States system is the possible fuel market which may be created in connection with the refining of low grade iron ores. It is estimated by the steel industry that the Mesabi reserves of high grade ore, if they are worked at their present high rates, will be depleted within a period of 10 to 15 years. There are, however, large volumes of lower grade ores on the Mesabi Range, and one of the most abundant of these is taconite. Various mining groups are now perfecting commercial methods for utilizing lower grade ores. There is a pilot plant now being operated by one



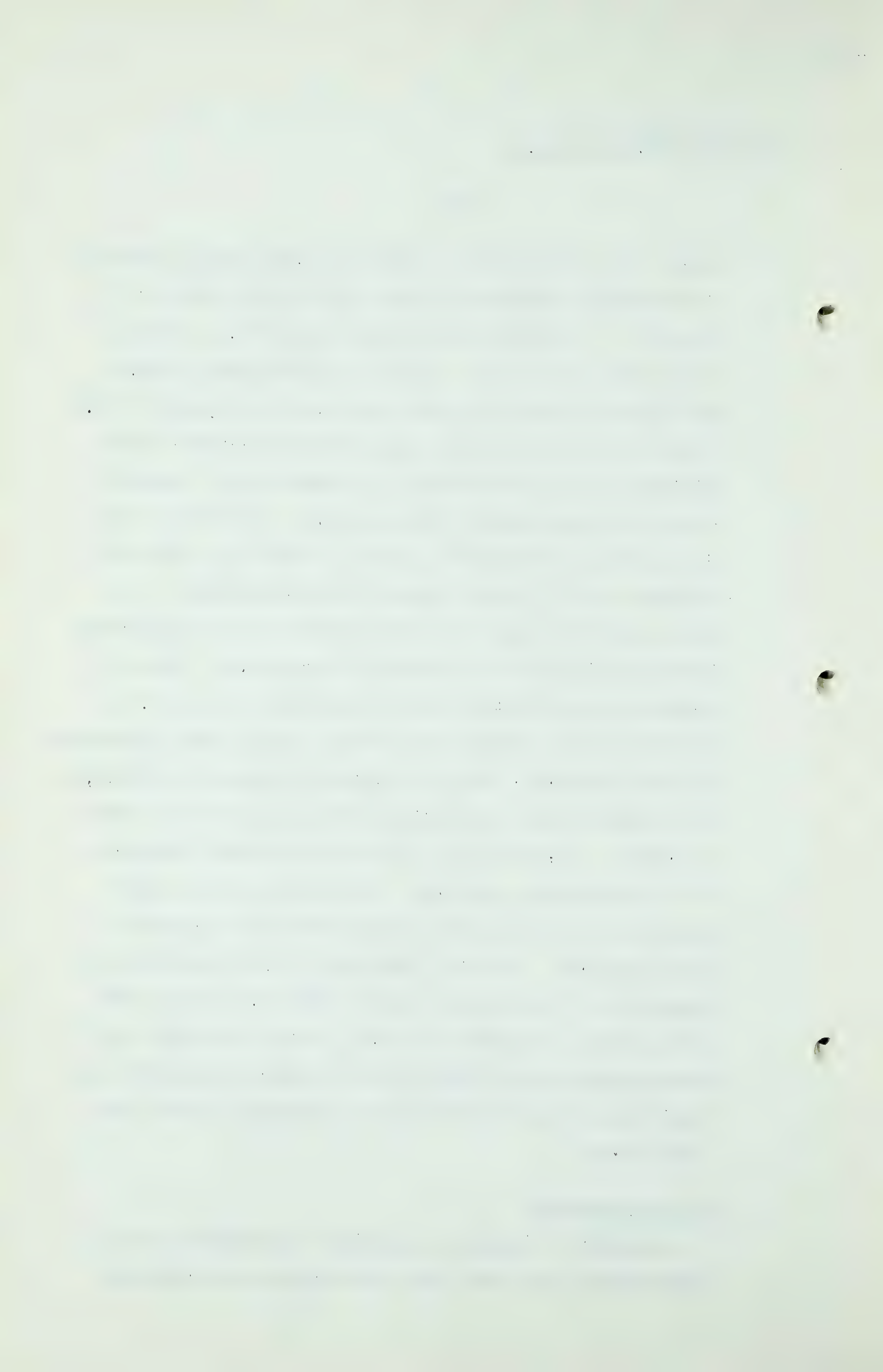
G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 382 -

group, and it is understood that they have nearly perfected a satisfactory commercial method for the utilization of taconite. The United States Steel Corporation, through their mining subsidiary, the Oliver Iron Mining Company, have recently announced plans and have, as a matter of fact, commenced construction of a semi-commercial plant for the preparation of approximately one million tons of concentrated iron ore annually from taconite. Discussions have been held with responsible people of the steel and mining industry and they have indicated their intentions to go ahead with full scale taconite plants as soon as they have investigated fully the details of the process. There are several proposed systems for the reduction of this ore, but they are all common in that they require large quantities of heat and power. While no definite figures are available, it is rumored that the processes will require in the order of 300,000 to 400,000 Btu and 40 to 50 kilowatt hours per ton of concentrate produced. It is this heat and power required by these processes which invites the fancy of fuel suppliers. It is not possible to fully appraise the magnitude of the potential load at this time, and so far the purposes of current estimates, we have included only the requirements of plants which are under construction or those whose construction appears a certainty in the very near future.

Gas Requirements

Appendix 6 indicates the annual and maximum daily requirements of a pipe line system which would serve the



G. B. Whitney,
Dir. Ex. by Mr. Martland.

- 383 -

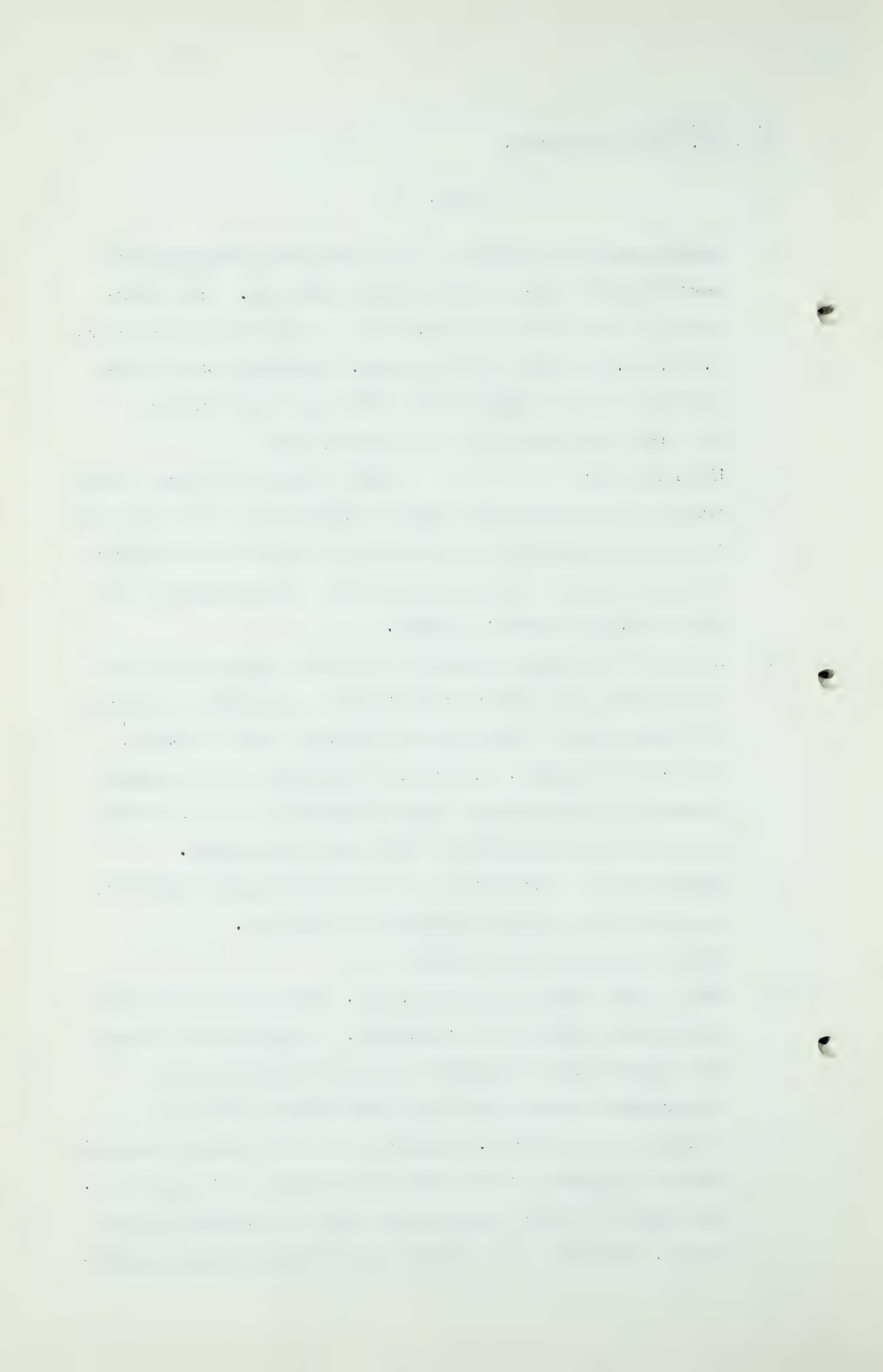
markets presented herein if the system were designed to serve the firm requirements on the peak day. The interruptible customers would have to be curtailed approximately 5,000,000,000 cubic feet per year. Operating under these conditions it is expected that the sales load factor in the fifth year would be approximately 65%.

Q MR. MARTLAND: Then perhaps you might explain briefly to the Board the various appendices. I do not think it will be necessary to review these figures which appeared in each of them. If you would just outline briefly what each appendix contains, please.

A Appendix 1 is a map intended to show the approximate route of the pipe line and the market areas. Appendix 2 indicates the population of the various cities and towns to which service is proposed. Appendix 3 represents the estimated customers in the various classifications at the end of the 5th year of the operation of the pipe line system. Appendix 4 is a tabulation of the estimated peak demand by classes of use, in the 5th year of operation.

Q That is the daily peak demand?

A That is the peak daily demand, yes. This assumes that all the gas you need will be available. It goes up to a somewhat higher figure than what is shown further on as requirements because the full interruptible load is included in the demand. Appendix 5 is the estimated annual demand by classes of use during the 5th year of operation. Here again the full interruptible load is included in the demand. Exhibit 6 is a tabulation showing the gas require-



G. B. Whitney,
Dir. Ex. by Mr. Martland.
Cr. Ex. by Mr. D.P. McDonald.

- 384 -

ments during the 5th year of operation, assuming that a pipe line system were designed to meet the 5th year peak firm demand. Appendix 7 is a tabulation of the weather data which was utilized in preparing the load estimates.

Q Thanks very much, Mr. Whitney.

CROSS-EXAMINATION BY MR. D.P. McDONALD:

Q I did not get the witnesses name.

THE CHAIRMAN: Mr. Whitney.

Q Mr. Whitney?

A Yes.

Q I just thought if you would turn to your schedule, say Appendix 3. I have tabulated or added up your totals for the Canadian section and it comes to 72,583. Is that about what you have?

A I have not got that total.

Q Well, you could take that as being about right?

A 72,583?

Q Yes. Now, I understand that of that group of customers Winnipeg is the only one that has a small gas distributing system?

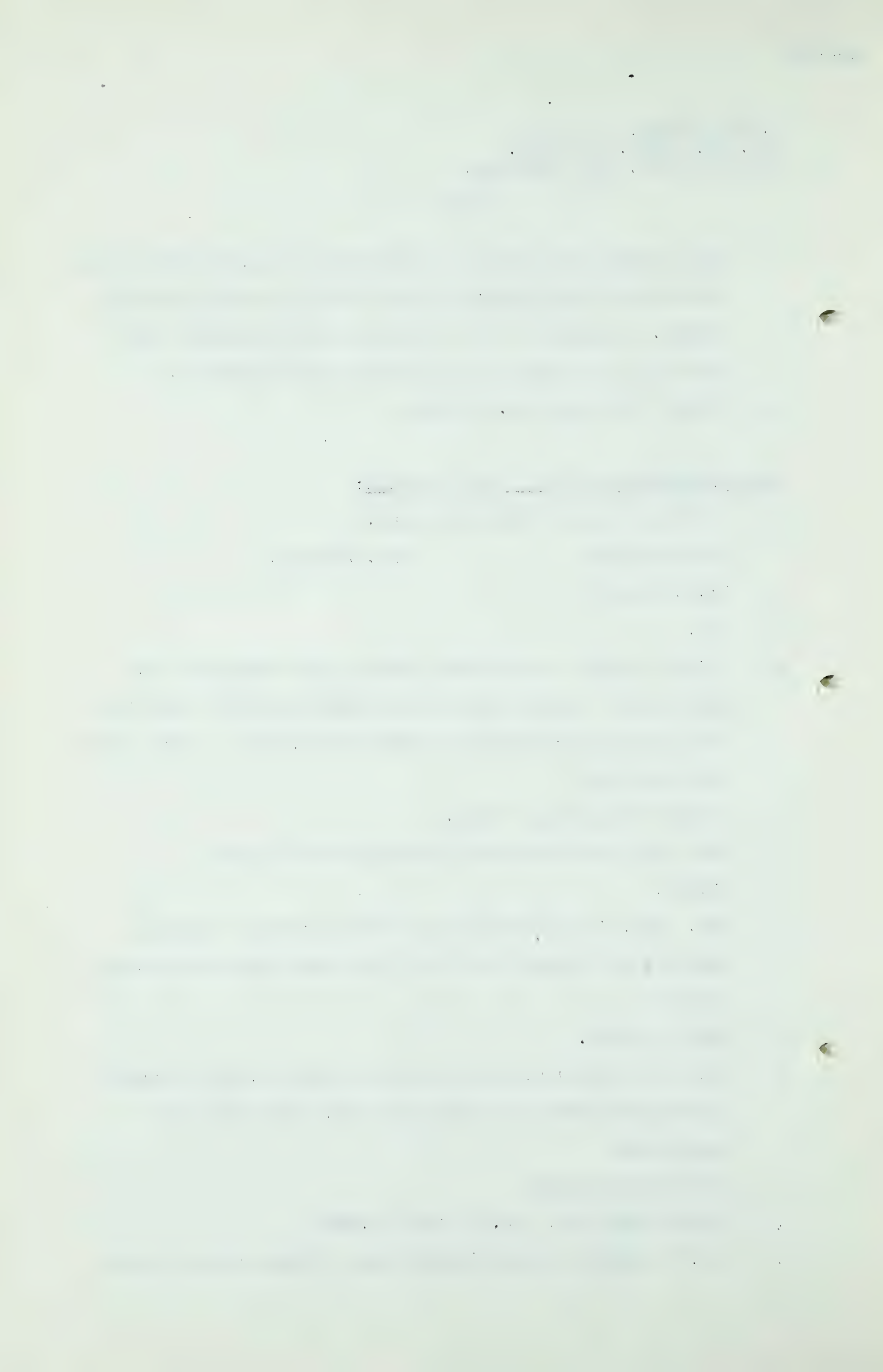
A That is right.

Q And that would leave you then with about 57,583 customers to be served with new facilities within the municipal boundaries?

A You are deducting?

Q 15,000 from that. 15,000 from 72,583?

A Yes, it would be approximately that. There could be some



G. B. Whitney,
Cr. Ex. by Mr. D.P. McDonald.

- 385 -

few additional customers connected to the present Winnipeg system.

Q Now, to what extent did you investigate the willingness of the towns and cities concerned to issue franchises and arrange for construction and building of their distribution systems?

A Well, from my assignment I assumed that such franchises would be obtained and the distribution systems built.

Q Yes. Could you tell me what you used as a yardstick as cost per customer of a distribution system in this Canadian area? Could you tell me how many hundred dollars per customer?

A Oh, I have some vague ideas on it. I think it would be upwards of \$200.00 per customer.

Q \$200.00 or \$300.00 or between the two?

A I would say between the two.

Q Well, let us take it at \$300.00, at that rate.

A Why \$300.00?

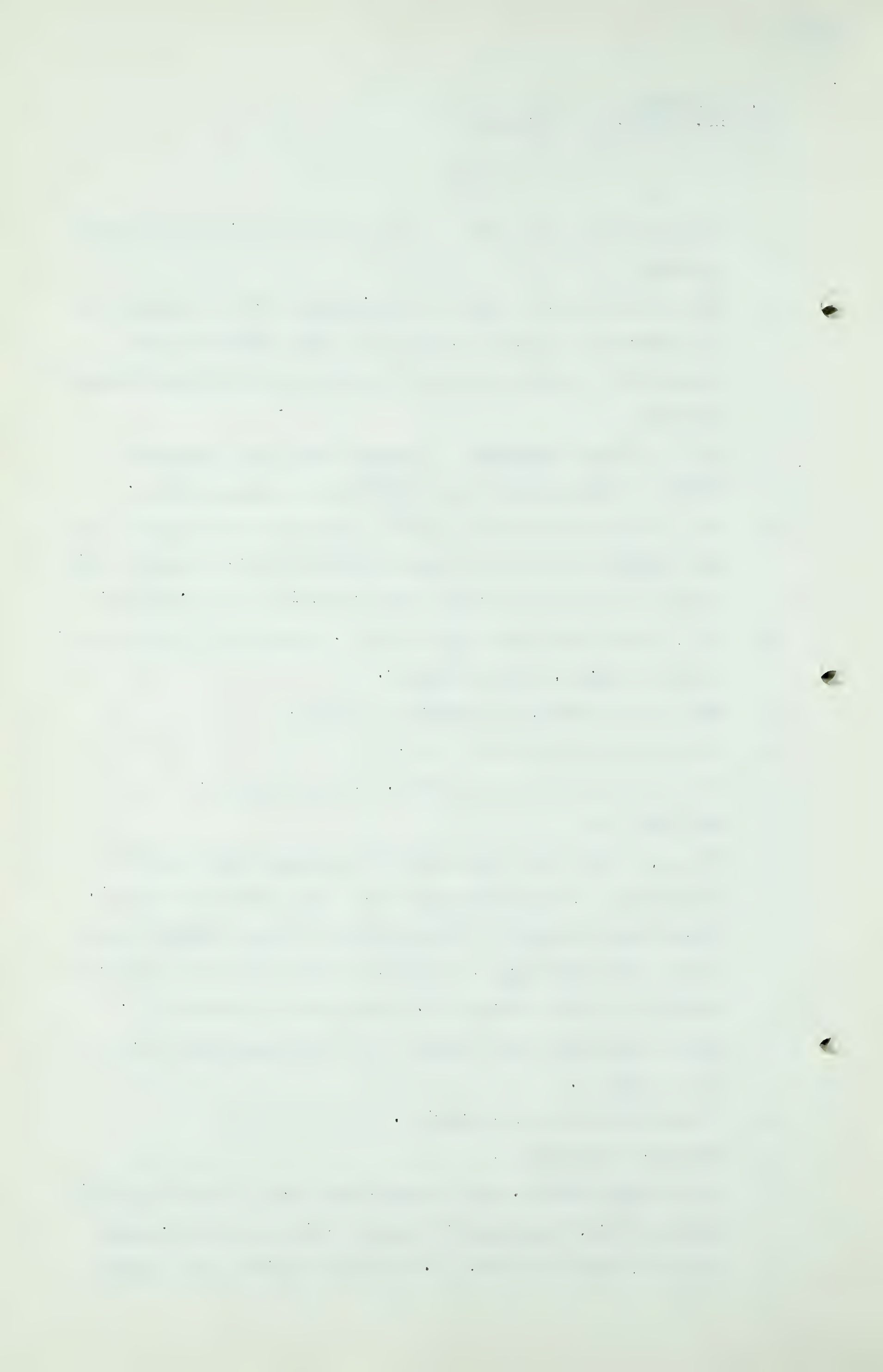
Q Well, we have had a great deal of evidence about costs of connections. They exceed \$200.00. As a matter of fact, \$225.00 was the cost of connection for the gas company here up to some years ago. I think it is now close to \$300.00. However, we will use \$300.00 just as an illustration.

A Costs like that would depend a lot on how many are put in at one time.

Q I agree with you, it varies.

A Numerous variables.

Q Let us take \$200.00 per customer then, and you have approximately 60,000 customers to serve, taking 57,000, taking a round figure of 60,000. Would that result in an expend-



G. B. Whitney,
Cr. Ex. by Mr. D.P. McDonald.

- 386 -

iture of about \$12,000,000.00?

A We have got 72,000 altogether, 72,583?

Q Yes?

A If we take away our 15,000 in Winnipeg?

Q Yes?

A 57,000. You want to round it off to 60,000?

Q Yes. \$200.00 per customer, that would amount to an expenditure of around \$12,000,000.00, would it not?

A Yes.

Q Now, can you tell me, are there any arrangements made with your clients with respect to providing facilities at that cost to these Canadian cities?

A I do not know of any arrangements, no.

Q And in the United States, as I take it from your Appendix 3, the balance of your customers, there are 72,379, taking our previous total from your total of 144,962?

A Yes.

Q Now, how many of these will be new customers in the sense that they are not now connected to any type of gas service?

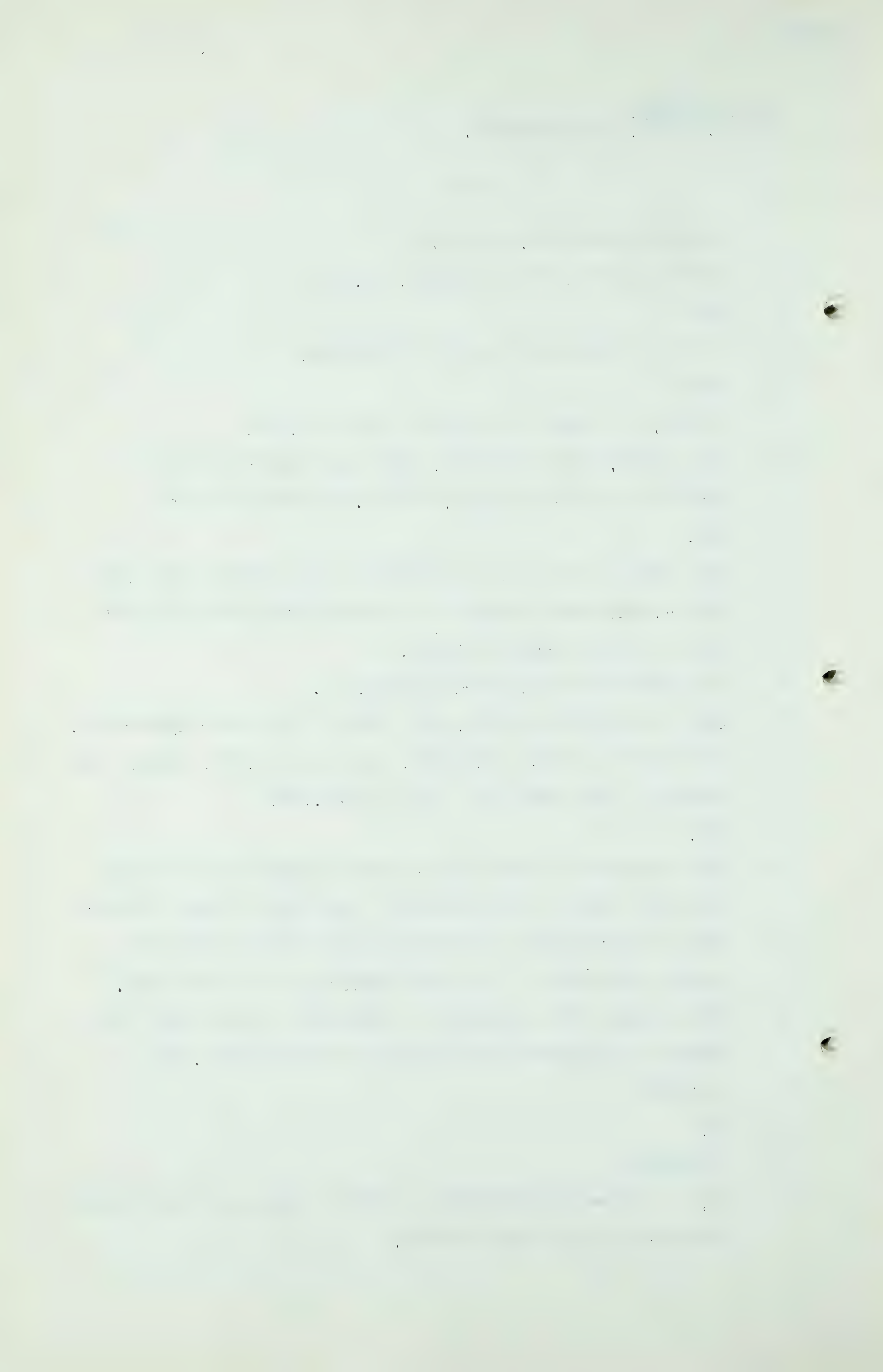
A Well, I don't have a tabulation of the total number of present customers. I can give them to you by each area.

Q Well I mean, have you given us anywhere in your report the number of customers now connected at Grand Forks, for instance?

A No.

Q Or Duluth?

A No. I have no tabulation. I have in my notes the existing customers in all those systems.



G. B. Whitney,
Cr. Ex. by Mr. D.P. McDonald.

- 387 -

Q Just take Duluth, for instance. You have an estimated number of customers for Duluth of 26,200 on your Appendix 3?

A Yes.

Q How many are now connected in Duluth?

A At the end of 1949 they had 25,627 residential customers. We have actually predicted very little growth in the Duluth area and the Mesabi Range area. The growth of that area depends entirely on what happens to this iron ore situation.

Q How about Grand Forks, North Dakota? You have 7160 at the end of the 5th year. How many now connected?

A Grand Forks, including East Grand Forks, Minnesota, both served by the same utility, is 13,000, approximately 13,900.

(Go to page 388)

G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 388 -

Q Yes. So that would be an increase of roughly 5000 estimated in your, in the combined submission?

A No, I am mistaken here. There are 4880 customers.

Q In Grand Forks, North Dakota?

A In Grand Forks and East Grand Forks.

Q And you have calculated an increase then of roughly two thousand some customers?

A Yes.

Q Now, just turning to Page 8, Mr. Whitney, you have referred to, I think, the taconite, is that the proper term?

A Yes.

Q The possibility of a taconite industry. Can you tell me what is the capacity of the plant to which you referred, how many tons per year?

A The one that is now operating, I was advised that it was producing 20 tons per hour.

Q Is producing 20 tons per hour?

A Yes.

Q How much raw ore does it take it, have you any idea? Which end is the 20 tons?

A That is the concentrate.

Q The concentrate?

A Yes, it is about 65% iron, there is about that much, 65% iron in the concentrate, and, as I understand it, these taconite ores are of the order of 35% iron.

Q How long has that plant been in operation?

A Well, it operated all through the last winter. I do not know how long before that. They shipped the first product this spring and it has been tested in the blast furnaces of Interlake Iron Corporation in Duluth.

G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 389 -

Q And what fuel has that plant been using up to date?

A Presently using light oil.

Q Presently using light oil?

A Yes. Of course, that is the pilot plant and at the present time they are not concerned with the economics, they are concerned with ironing out the technical details of the process.

Q To what extent have you discussed with these people the size of the plant that they will erect or may erect after this trial period?

A Well, this group indicated that the minute they got all the bugs out of the system, and they indicated they were approaching that point, they were going ahead with a plant to produce somewhere between two and ten million tons annually, and their present guess was that it would be half-way between.

Q What type of fuel did they contemplate using in there?

A They have not decided on the fuel as yet.

Q Did you have any discussion as to the price they would be prepared to pay for gas if it was available?

A Yes, to some extent. However, I have assumed in the estimates that gas would be cheaper than any other fuels that they could utilize.

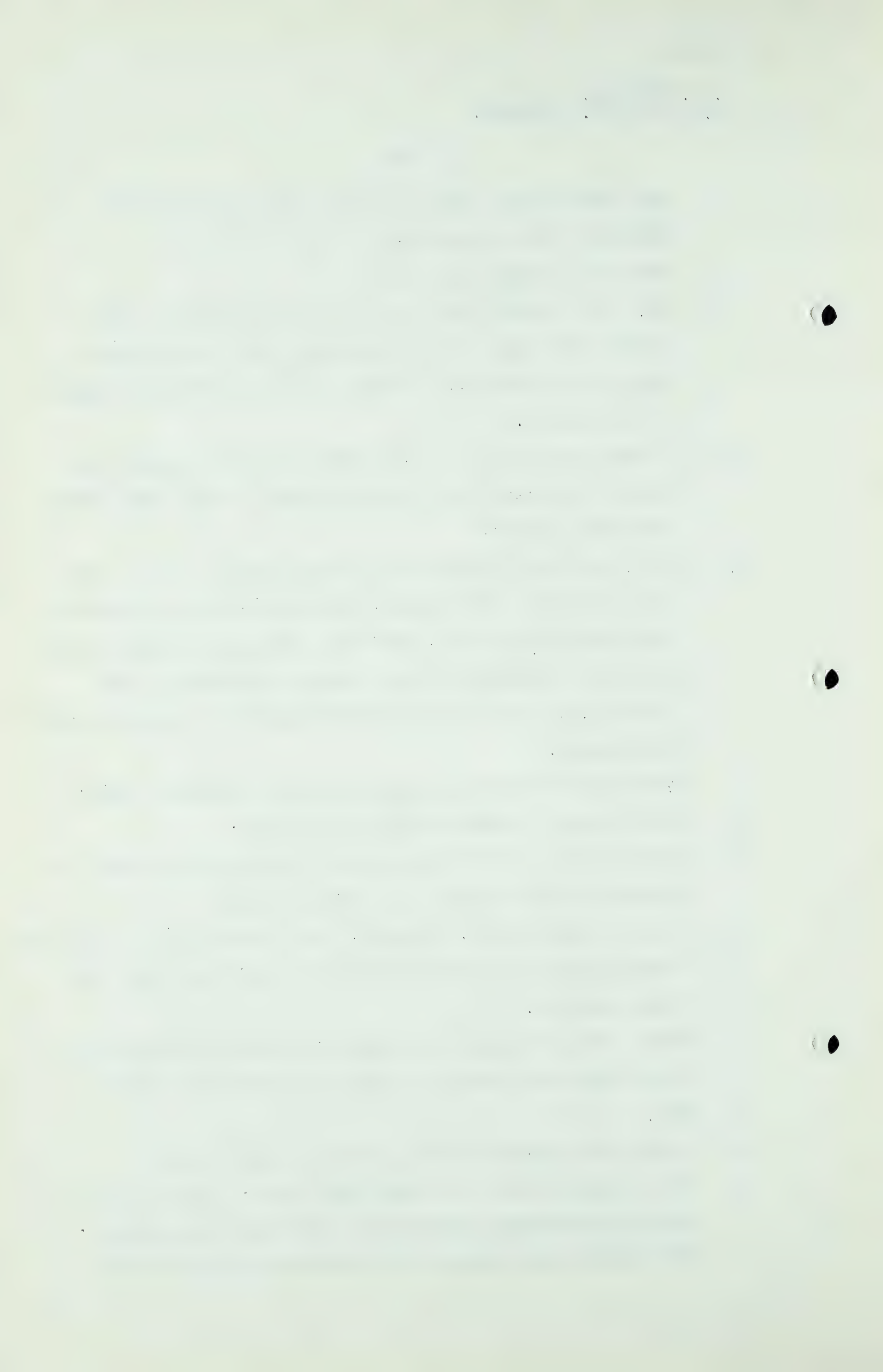
Q Yes. Well, I do not find anywhere in this submission of yours where you refer to prices of competitive fuels?

A No.

Q I have not noticed any oil prices or coal prices?

A No, I haven't any in the statement here. There are so many of them along the various points along the system.

Q What would your contract be on an interruptible basis?



G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 390 -

A Well, that is a deal that would have to be worked out. For the purpose of the estimate I have assumed it would be a firm load.

Q Would it be interruptible or not?

A I have assumed it would be firm.

Q It would be firm?

A Yes.

Q For this particular plant?

A Yes.

Q Well, can you give us any idea of what the price would be for the gas to be able to meet competitive fuels at that particular location?

A I can tell you what coal sells for in that area.

Q Yes?

A In the City of Virginia the Water and Light Commission there are presently paying about \$10.90 per ton for coal.

Q What is the BTU value of that coal?

A I think their coal is, well, their coal averages to 13,000 BTU.

Q And the price you gave us was \$10.00?

A \$10.90.

Q \$10.90?

A Yes.

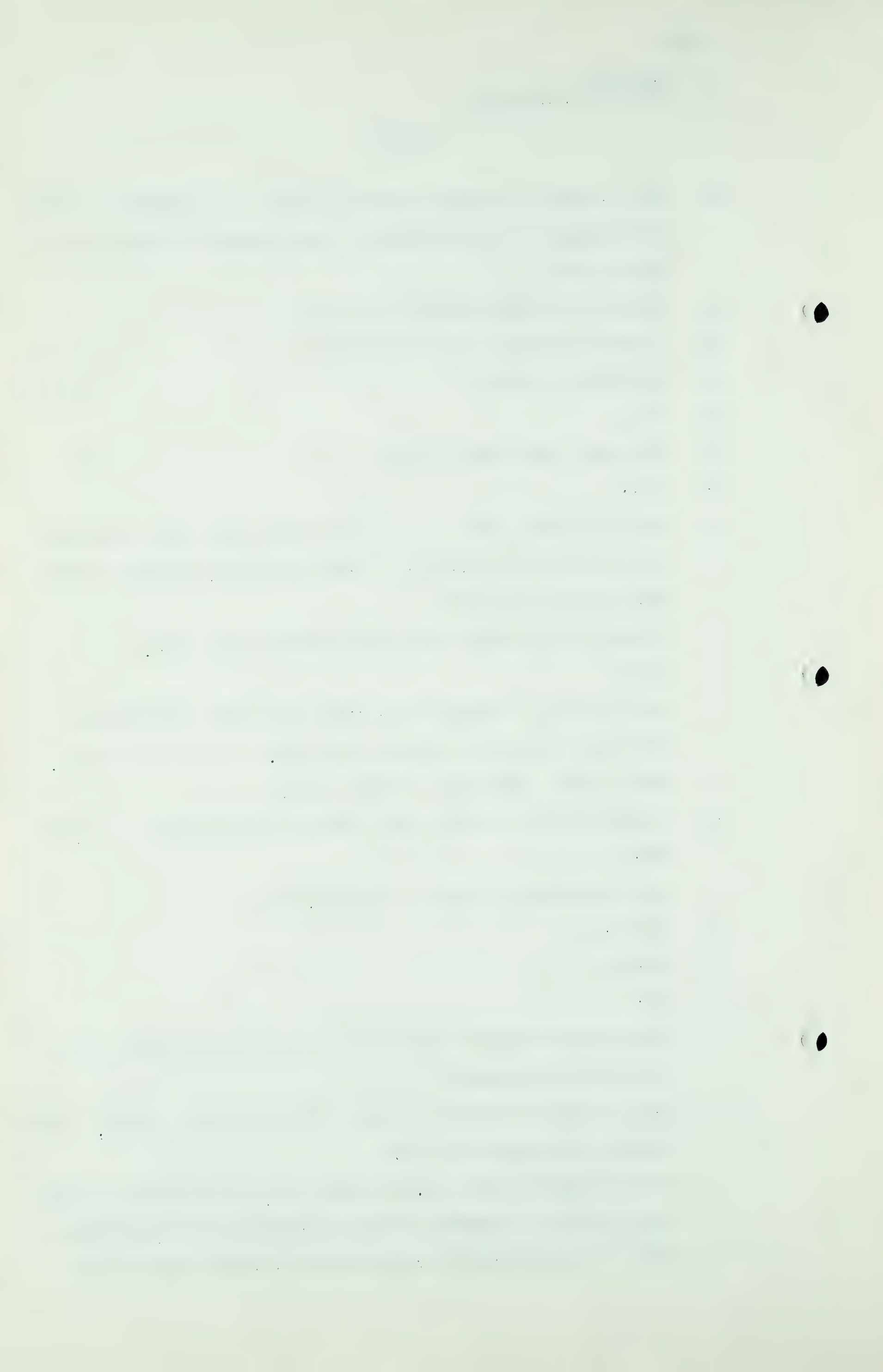
Q Do you know whether the price of the coal has gone up in the last few months?

A No, I haven't checked it since the time of the survey, which was the first part of June.

Q Can you convert that \$10.90 price to 1,000 BTU gas per MCF?

A Well, it is - I think it would be 42 cents at 13,000 BTU.

Q Have you any indication whether the process used in this



G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 391 -

plant will be one that can be used with natural gas?

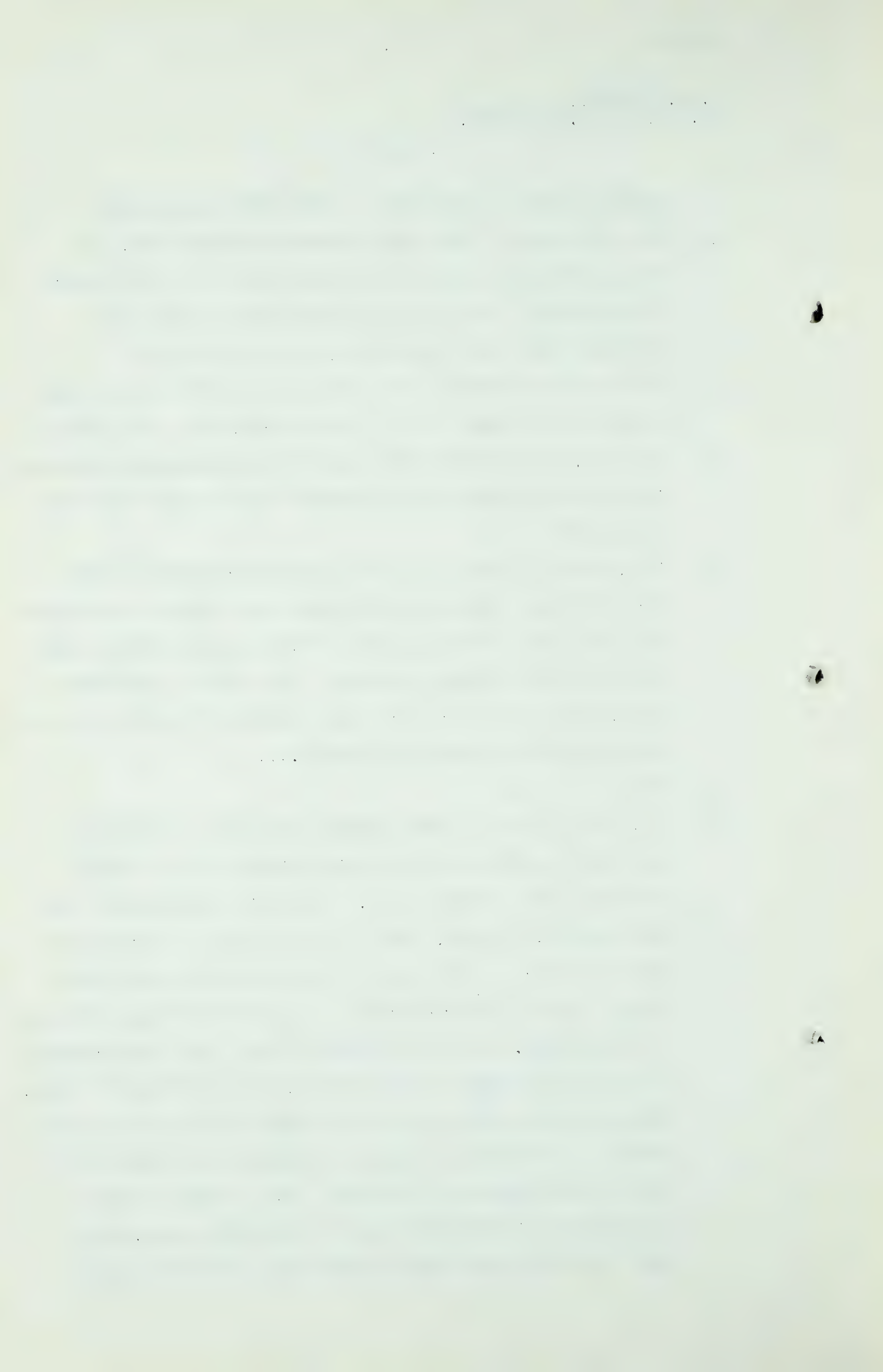
A The operators of these pilot plants indicate that, or this pilot plant indicate that gas would be a very satisfactory fuel. It is a kiln operation, and they have indicated that they can burn oil or coal or gas.

Q Then on Page 9 you say this, "It is rumoured that the processes will require in the order of 300,000 to 400,000 BTU and 40 to 50 kilowatt hours per ton of concentrate produced." Why do you use the word "rumoured"? Did you get that from any place?

A Well, there is quite a lot of competition amongst these various groups that are perfecting these taconite processes and, of course, there is a lot of talk in the Mesabi Range area about the taconite process. The utility operators in Duluth, of course, are very much interested in this because it affects their load considerably.....

Q Yes?

Aand they quoted some figures which they had used so that when I talked to these pilot plant people I asked them what their figures were. They did say that the fuel requirements, as such, would be equivalent to 3 gallons of light fuel oil. They had that figure pretty well established, which I figured would be somewhere between 300,000 to 400,000 BTU. And with regard to the power requirements I had heard that they might be as high as 60 kilowatt hours. These operators said that at the moment they were in the process of checking the power consumption and hesitated to come out and give any figures on it. So that I then asked them if it would be about 60 kilowatt hours, and they said no, that would be too high, and having regard



G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 392 -

to my questioning I figured that 40 to 50 kilowatt hours per ton would be about what they would require.

Q I take it you have included in your estimates some of these plants. Now, was it those which are under construction or those whose construction appears a certainty in the very near future? And can you indicate where in your estimate those items have been included, in what towns?

A Yes. The Oliver Mining group is constructing a plant in Virginia, and it is the firm, the large firm industrial customer that is indicated on Appendix 3.

Q How much did you allocate towards that plant in your estimate in the way of annual load in daily feet?

A That is in the firm. It shows in your schedule.

Q That gives us in Appendix 5, that is the firm?

A Yes.

Q Of 980,000 MCF?

A Yes, 980,000.

Q Now, what other plant is under construction?

A The other one is this one of the Erie Mining group who are the operators of this pilot plant, and they have not definitely set their location but they indicated it would be on the eastern end of the range. The pilot plant is at Biwabik, so that is where I assume the new plant would be.

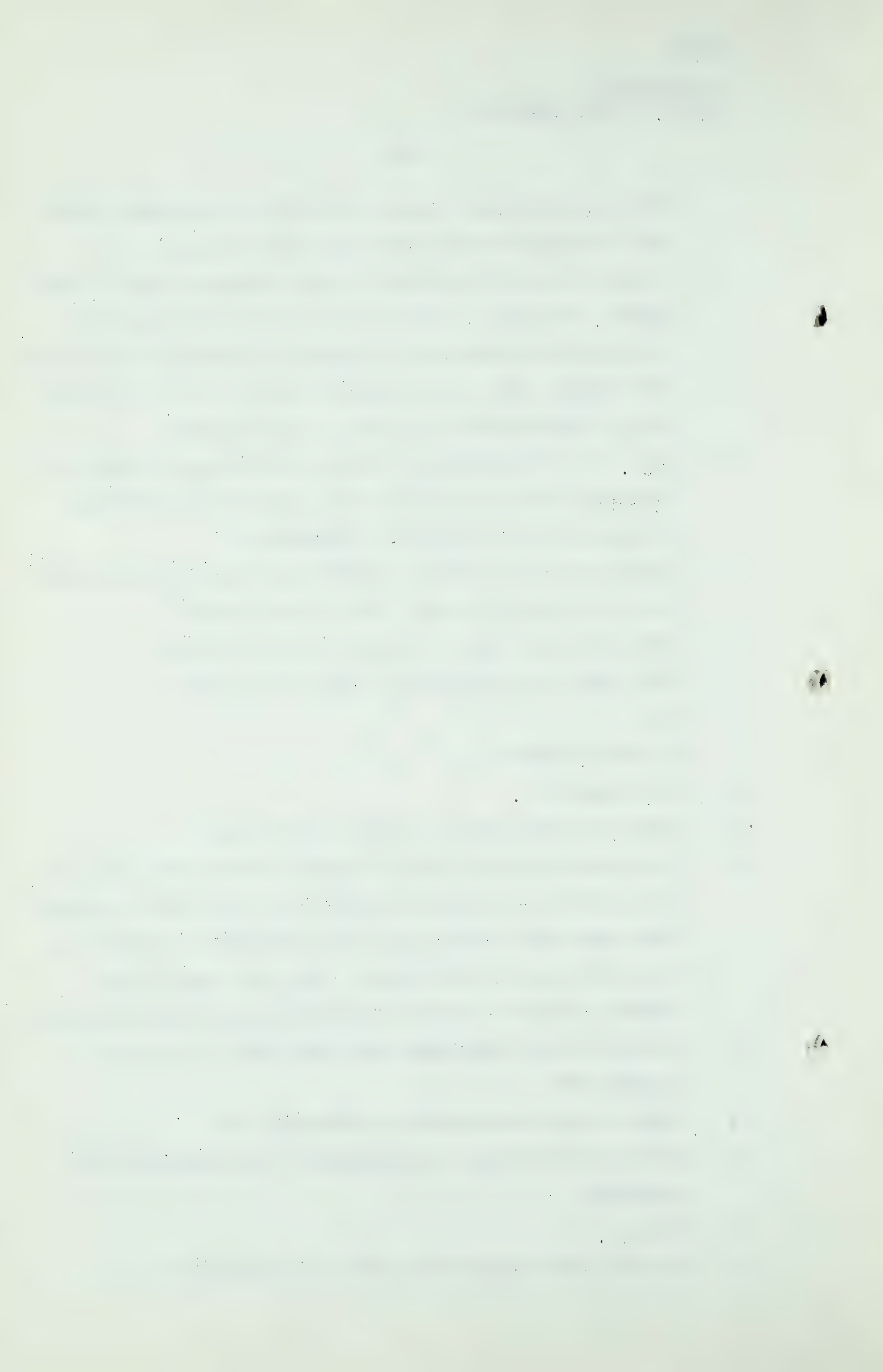
Q And that is the firm plant that you refer to in your Appendix 3?

A That is the firm customer for Biwabik, yes.

Q And you set that up in your Appendix 5 at 2,630,000 MCF annually?

A Yes.

Q And what other plants are under construction?



G. B. Whitney,
Cr. Ex. by Mr. MacDonald

- 393 -

A Those are the only two that I know of at the present time.

Q How about this construction that appears a certainty in the very near future?

A Those are the two.

Q Those are the two?

A Yes.

Q They are not two others, they are the same ones?

A They are the two plants, one in Virginia and the other one in Biwabik. Since this estimate was made there was a newspaper report of another group who have been conducting laboratory tests in Kentucky; they have announced that they have purchased property at Beaver Bay, Minnssota, for a taconite plant.

Q What assurance have you from these people that they will take this gas? Have you anything in writing, I mean?

A No assurance. Well, let me put it this way, I have assumed that we can get them cheaper fuel, if we can get them cheaper fuel that they will use it.

Q And you have not discussed the matter of conditions with regard to this matter of price?

A That is right.

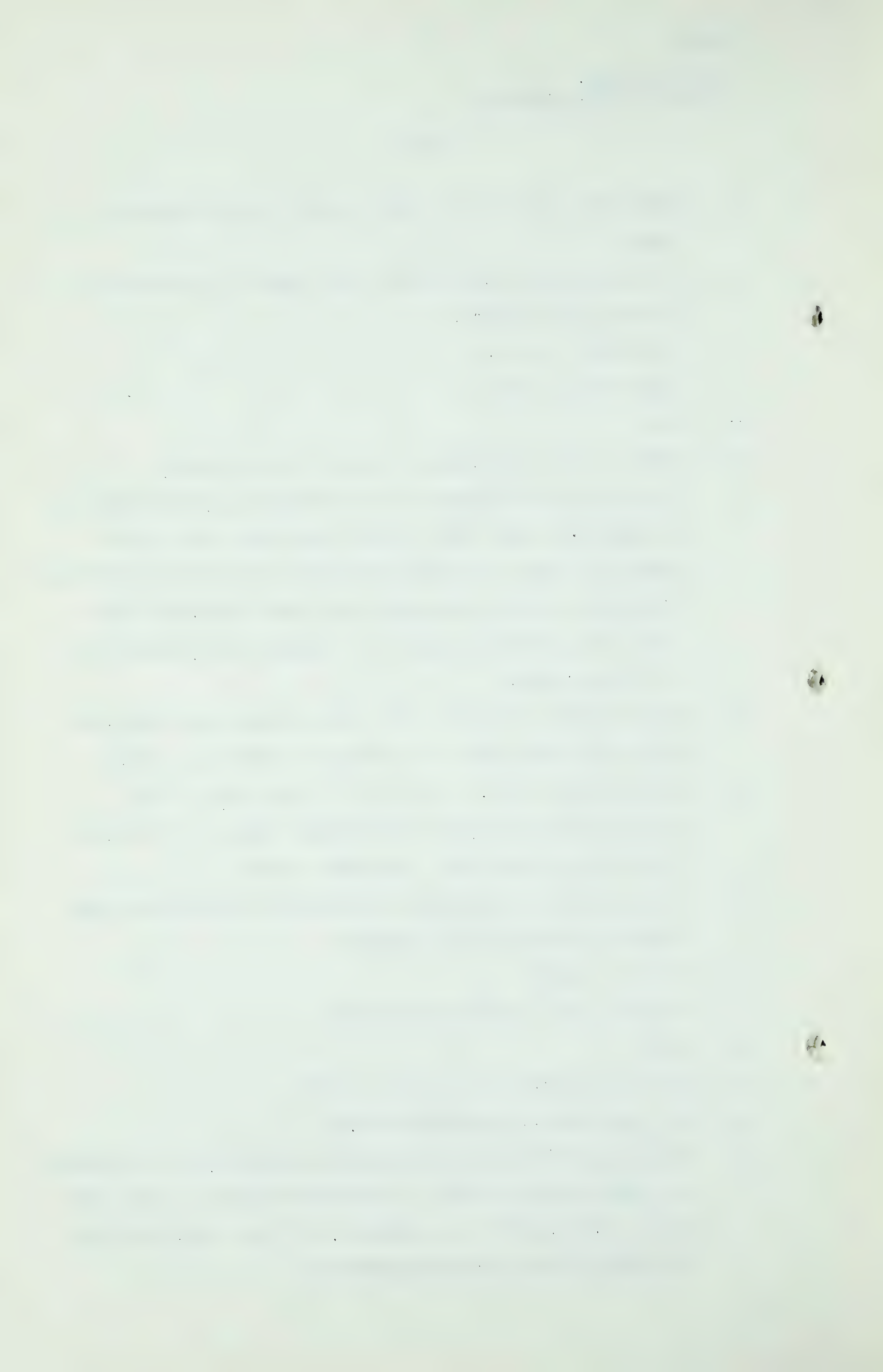
Q That is, that it must be cheaper?

A Yes.

Q Have they indicated it must be firm?

A No, they have not indicated that.

Q Now, just looking at your exhibit, Appendix 5, as I figure it out, the total sales in the United States in your 5th year is 42,132,000 - oh, pardon me. Your total sales are 53,384,100 MCF in your Appendix 5?



G. B. Whitney,
Cr. Ex. by Mr. McDonald

- 394 -

A Well, Appendix 5 represents demand rather than sales.

Q Well, now, are you setting this up as demand or are you indicating that this is what you estimate you are going to sell?

A No. What I mean by demand here is the amount of gas which would be utilized if you gathered up these customers and allowed them to take all they desired to take. These interruptible customers, this interruptible use of 26 billion on Appendix 5 would have to be curtailed if you built a system which would serve the 5th year peak requirements.

Q Do you mean that you could not get this much interruptible sales under contract?

A No. You physically could not deliver it.

Q I know. Your interruptible will not be delivered during the peak day, I quite appreciate that, but what I am getting at is....

A If we deducted the amount of the curtailment of the interruptible customers from the 63 billion, we would get the same result.

Q Yes. And that refers you to your Appendix 6, doesn't it?

A That is right, yes.

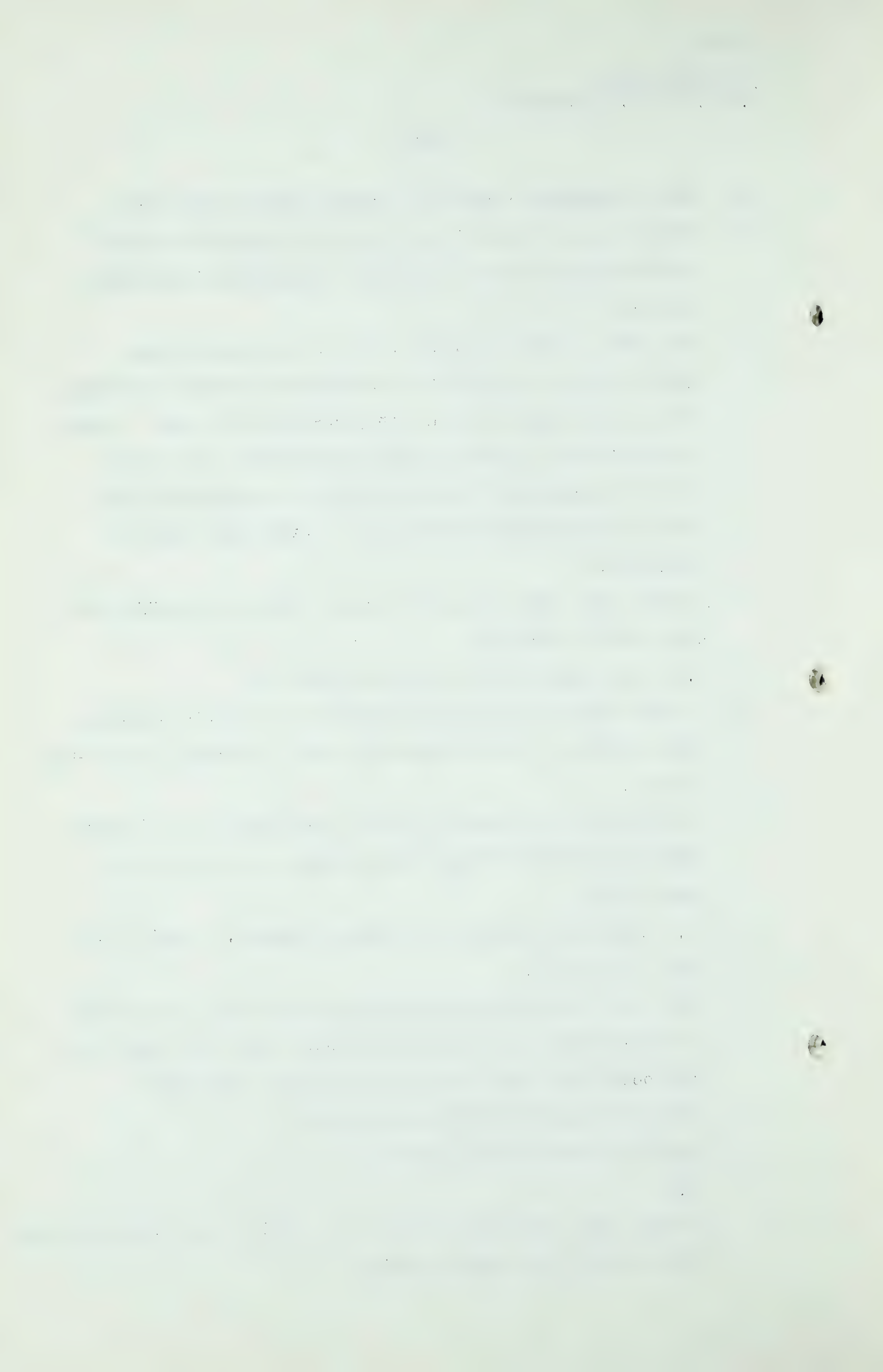
Q Just let me ask you this question, with regard to Appendix 5, the distribution system losses, now what does that refer to? Does that refer to losses within the customers?

A Within the retail distribution system.

Q Within the distribution system?

A Yes.

Q So that your total figures here on Appendix 6 of 58,341,800,000, that is what you intend to sell?



G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 395 -

A No, that includes some pipe line use.

Q The two items of compressor fuel?

A Yes.

Q And line losses?

A Yes. The total sales would be 58,000,000,000 less 1,795,500,000 and 7,731,000.

Q And then the balance of your 58,341,800,000 would be made up of your totals in Appendix 6 leaving out your interruptible?

A No, including the amount of interruptible that can be sold with a pipe line designed to meet the 5th year maximum requirements, the interruptible sales set out in Appendix 6 total only, well, some 5 billion less than the total interruptible demand indicated on Appendix 5.

Q Yes, but what you are going to contract is not interruptible in Appendix 5, and when you multiply it by 365 that does come to your 5,000,000,000 and I thought that is what you dropped?

A In Appendix 5 is your annual quantities.

Q Yes. Well, you are actually going to sell your interruptible to that extent?

A Not to the 26 billion, but to the total of the two figures shown on Appendix 6.

Q I see. So that your actual demand on your pipe line, what you are going to have to get on this end of the pipe line is going to be 58,000,000,000 per year roughly?

A Yes, that is the requirement.

Q That is the requirement?

A Yes.

Q Now, you mention that this gas that is being sold at Duluth

G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 396 -

and Superior is coke oven gas. What are the rates at which that gas is sold?

A The rates, roughly?

Q Yes, to the city?

A To the residential customers?

Q No, what is the wholesale rate to the distributing company, from the smelter company? I presume it is from the smelter company?

A Yes, from the Interlake Iron. It is something on the order of 35 to 36 cents per MCF for 500 BTU.

Q For which?

A 500 BTU gas.

Q 500 BTUs?

A I think that is the figure.

Q It is 500 BTU gas?

A I will just check a minute here. Well, it is either 500 or just slightly over it.

Q All right.

A Between 500 and 525.

Q Now, dealing with the interruptible customers, Mr. Whitney, what can you tell us are the interruptible customers you are referring to now?

A Which area in particular?

Q Well, in your Appendix 5 you give the Canadian area, and you have referred to that?

A Yes.

Q In your report?

A Yes.

Q But dealing with the United States?

A The only interruptible customers in the Canadian area are

G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 397 -

the electric plants in Saskatchewan.

Q Yes?

A In Regina they are currently using bunker seed oil and in Saskatoon and Prince Albert plants they are using lignite.

Q Yes?

A In the United States it is nearly all coal. Grand Rapids has a paper company using coal. Along the Range we have got some heating plants that use coal. In Duluth where the bulk of the interruptible will be is the Minnesota Power & Light Company, and their fuel is coal.

Q What is the price of coal at Duluth, isn't it a very cheap coal, that they get in Duluth?

A Not particularly cheap. I have got some coal prices here. The American Steel & Wire says that their price of steam coal is \$8.80 per ton.

Q How about the United States Steel Company, does it not distribute coal in Duluth?

A Do they not distribute coal in Duluth?

Q Yes, or their subsidiaries?

A Not as such that I know of. The Minnesota Power & Light, the coal costs in 1949 averaged \$9.45 for 12,564 BTU coal. They would probably be about the lowest priced fuel consumer in Duluth.

Q And that is your largest interruptible customer also?

A Yes.

Q That is the power plant that you refer to?

A Yes.

Q Now, have you looked at Appendix 2, or if you will look at Appendix 2, Mr. Whitney?

G. B. Whitney,
Cr. Ex. by Mr. McDonald.

- 398 -

A Yes.

Q In Appendix 2 you show a total of 782,143 as being served by this line. As I count the number of towns or cities it comes down to 23? I mean I have counted them?

A Yes.

Q Tell me, how long is this line going to be? Can you tell me that?

A I do not have the details of design.

Q But just the length is what I was wanting?

A Roughly?

Q Yes?

A The main line is - well, the main line distance set out here is something over 1100 miles.

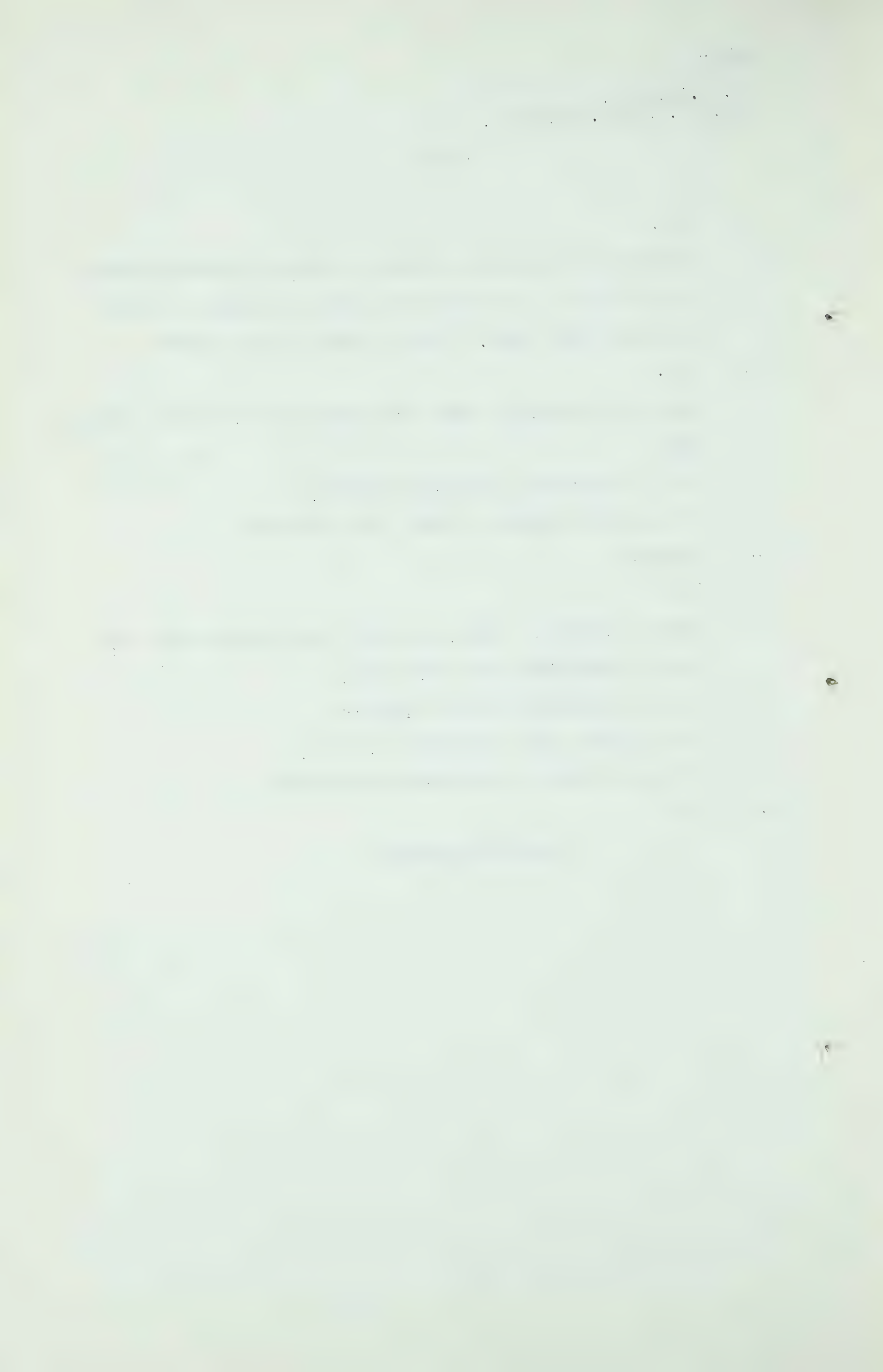
Q And the laterals to Prince Albert?

A I do not have the information on that.

Q You do not have the information on that?

A No.

(Go to Page 399)



G. B. Whitney,
Cr. Ex. by Mr. D.P. McDonald.

- 399 -

Q So that you have 1100 miles of main line to serve just under 800,000 people?

A Yes.

Q Now, could you tell me this, is it not practically all of the cities in Canada particularly, possibly in the United States, that you are going to serve also adjacent to or right on the Inter-Provincial oil line that is now built to Superior?

A It parallels it in some areas. Of course, the Inter-Provincial line originates in the Edmonton area. Through Minnesota it does come close to this route, I think.

Q It terminates at Superior?

A It terminates at Superior.

Q Yes. And is it not so that under those conditions Alberta gas would be competitive with Alberta fuel oils, or oils derived from Alberta oils?

A Oh yes. To get into a discussion as to what will happen in the future as to competitive fuel, from the estimates presented here I have necessarily assumed the existence of presently competitive fuels.

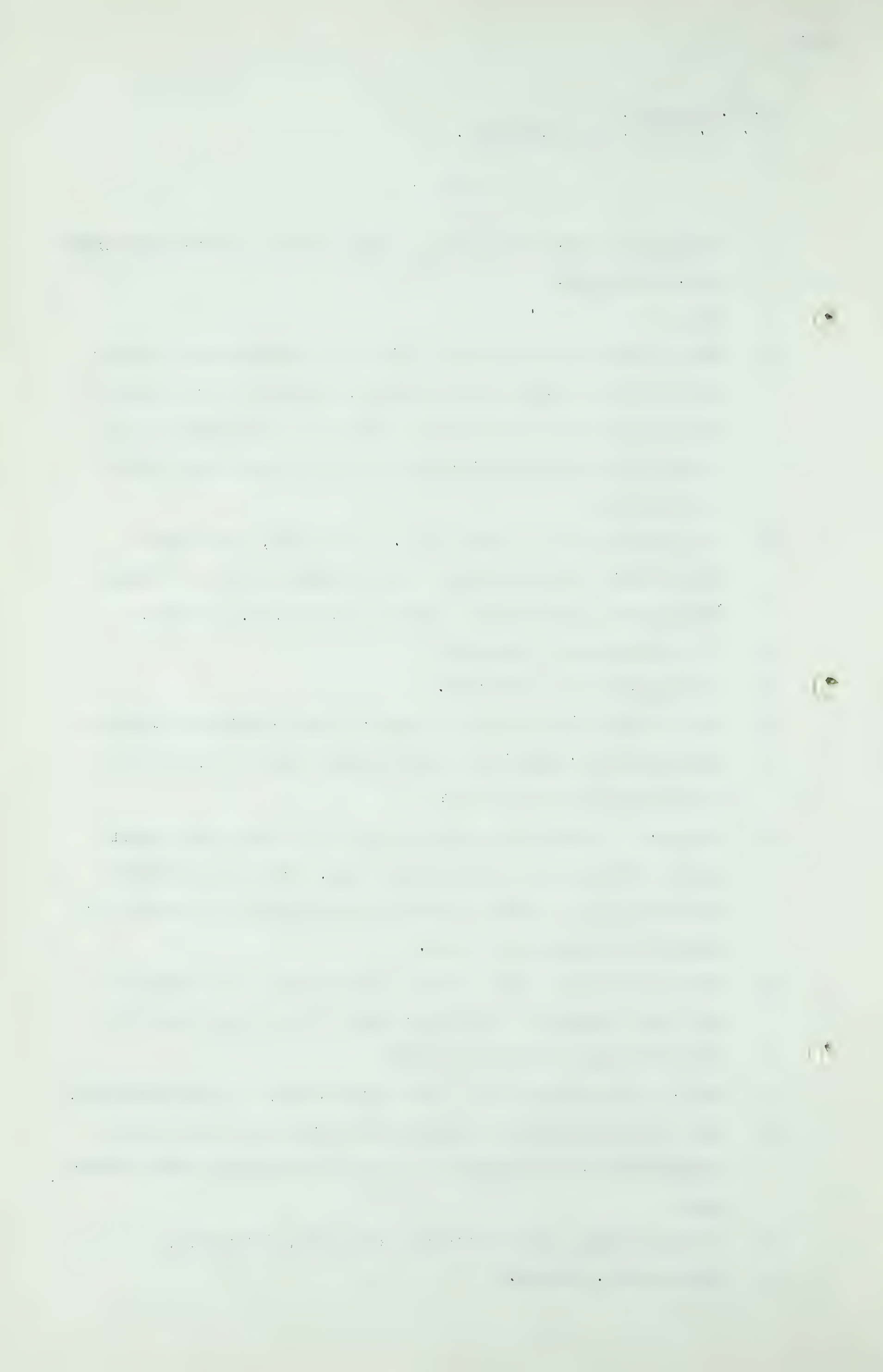
Q You did not take into account any change in the price of oil, for instance, that may result from the delivery of Alberta crude oil in that area?

A Well, I do not see how it can particularly be accounted for.

Q But if oil and gas is competitive there, there is a good possibility Alberta crude oil will be competing with Alberta gas?

A I do not know what the market areas are, I am sure.

Q That is all, thanks.



G. B. Whitney,
Cr. Ex. by Mr. S.B. Smith.

- 400 -

CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Mr. Whitney, did you know when you were down surveying these towns and cities at what price Western Pipelines could deliver Alberta Natural Gas at?

A No.

Q You were simply assuming that natural gas could be delivered in Eveleth, Minnesota, for instance, at a price which would be less than the cost of coal or fuel oil or whatever fuels were used there?

A We necessarily had to make some basic assumptions.

Q That is quite an important basic assumption, of course?

A Yes, very important.

Q Using that basic assumption you do suggest then, I take it, that you can make an accurate estimate that in Eveleth you will have a total of 1300 residential customers and 110 commercial and small industrial, one firm of no interruptible customers at the end of the 5th year. Those are your figures?

A What is your question?

Q Making that basic assumption, you then estimate you can get that number of customers in Eveleth divided as they are divided in your Appendix 3. That is what you have done?

A Making the basic assumptions that we have?

Q Yes?

A We have estimated the customers as shown.

Q How can you estimate how many customers you are going to sell gas to if you do not know the price of gas?

A It was necessary to assume that the gas would be competitive with certain other fuels.

Q Well now, we will say the price of gas, the more customers

G. B. Whitney,
Cr. Ex. by Mr. S.B. Smith.

- 401 -

you would get, I suppose, if the price of the gas was half the price of the coal comparatively speaking, you would get a lot more customers, wouldn't you?

A You are talking now about retail price?

Q Yes? Domestic users. If, for instance, you could get the same amount of heat by using natural gas for half the price you would pay for coal you would get a lot more consumers, wouldn't you?

A Well, the price structure does have a lot to do with it.

Q Like anything else, the cheaper it is the more customers you can sell it to, is that so?

A Yes.

Q So the more closely your price approximates the price of other fuels the fewer customers you would get?

A There is some relationship.

Q There is a very definite relationship, Mr. Whitney. Of course there is, isn't there?

A Well, there are numerous other factors.

Q But that is a very important factor, isn't it?

A Price is a very important factor.

Q Now, you would not suggest, I take it, that it would be feasible or economical at the present time for Western Pipelines to build a line to Winnipeg without carrying it down into the United States, would you, or do you know?

A Well, I have not - - economics is not part of my assignment on this, it is principally markets.

Q You do not care to express an opinion on that, or you agree it would not be economical?

A I have no opinion.

G. B. Whitney,
Cr. Ex. by Mr. S.B. Smith.

- 402 -

Q You have no opinion on it at all?

A No.

Q It does not come within your field at all then?

A My particular assignment on this job was the preparation of the market estimates.

Q Your main line is 1100 miles, you told Mr. McDonald, in length, and besides that you would have several hundred miles of laterals, as you call them, one to Saskatoon, one into Winnipeg or north of Winnipeg, I guess?

A One into Selkirk.

Q Selkirk, yes, and one down to Fargo, isn't it?

A Yes, Fargo.

Q It is pretty hard to read the print on this map, it is so small.

MR. NOLAN: You are not the only one.

Q MR. S.B. SMITH: You do not know the total length but in any event you are going to build that line, at least, you propose to build that line right down into the United States, and how close does it come to Minneapolis and St. Paul?

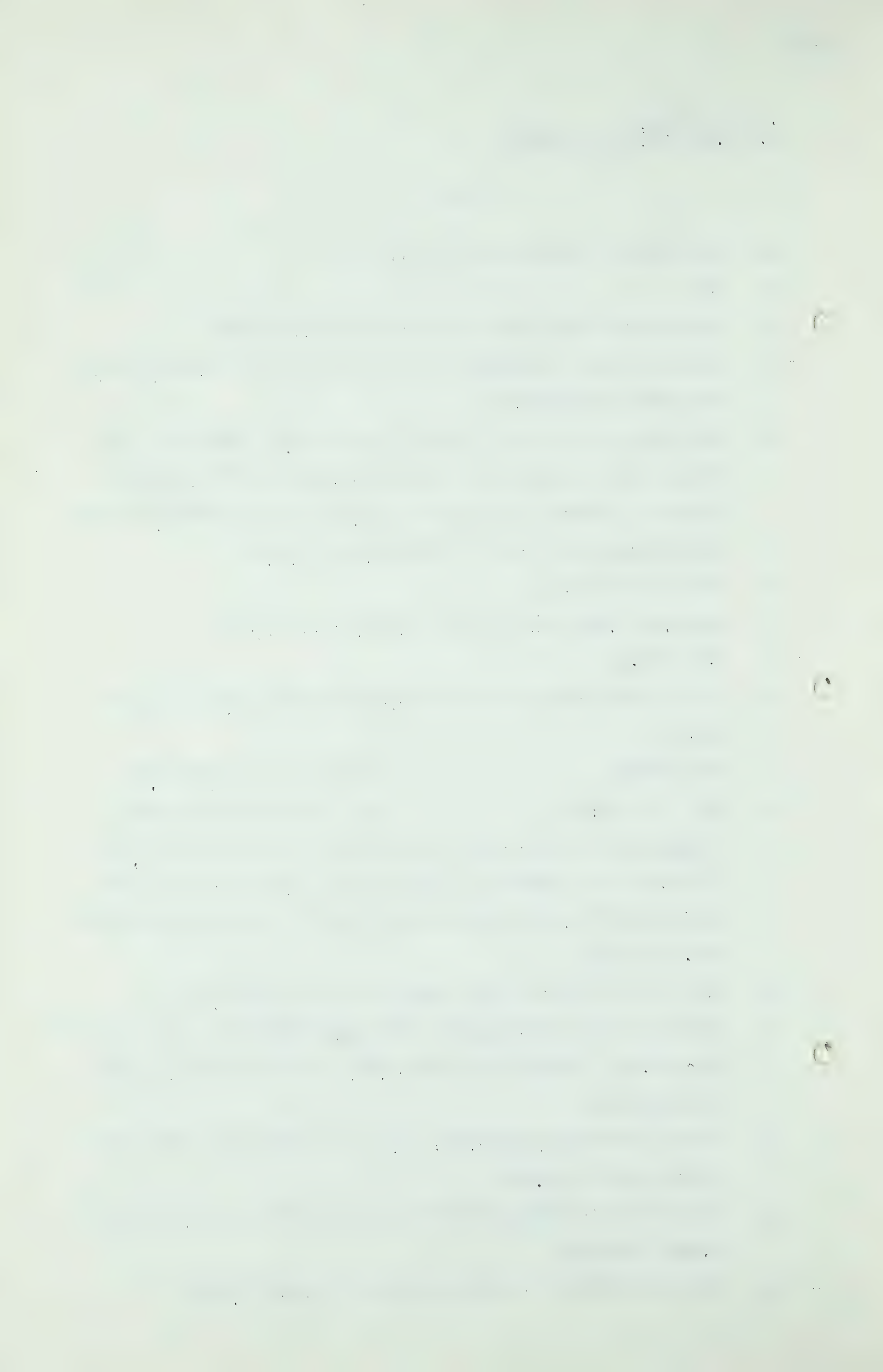
A Well, all I can do is to scale it on the map here.

Q Would you mind scaling it? Just approximately, I do not want it exactly. There is a scale here. Will your slide rule do that too?

A It will do almost anything. Well, it would be just something over 100 miles.

Q So you were taking an 1100 mile line from - - where does it start, Pincher?

A We have shown it as originating at Pincher Creek.



G. B. Whitney,
Cr. Ex. by Mr. S.B. Smith.

- 403 -

Q All the way through Western Canada down into the United States within about 100 miles of Minneapolis and St. Paul. Now, in that field there is already a natural gas company, isn't there, called Northern Natural Gas Company?

A Northern Natural Gas does deliver gas to Minneapolis and St. Paul.

Q That is quite a good sized company?

A Sizable, yes.

Q Not a little one. And they bring gas from Texas, don't they, and Oklahoma?

A Yes, I believe their supply is.

Q And how long is their line, or do you know?

A I do not know offhand.

Q You do not suggest that you, that is, Western Pipelines, will get into within 100 miles of Minneapolis and St. Paul without a battle before the Federal Power Commission with Northern Natural Gas Company, do you? You would anticipate that, wouldn't you?

A Yes, anticipate competition.

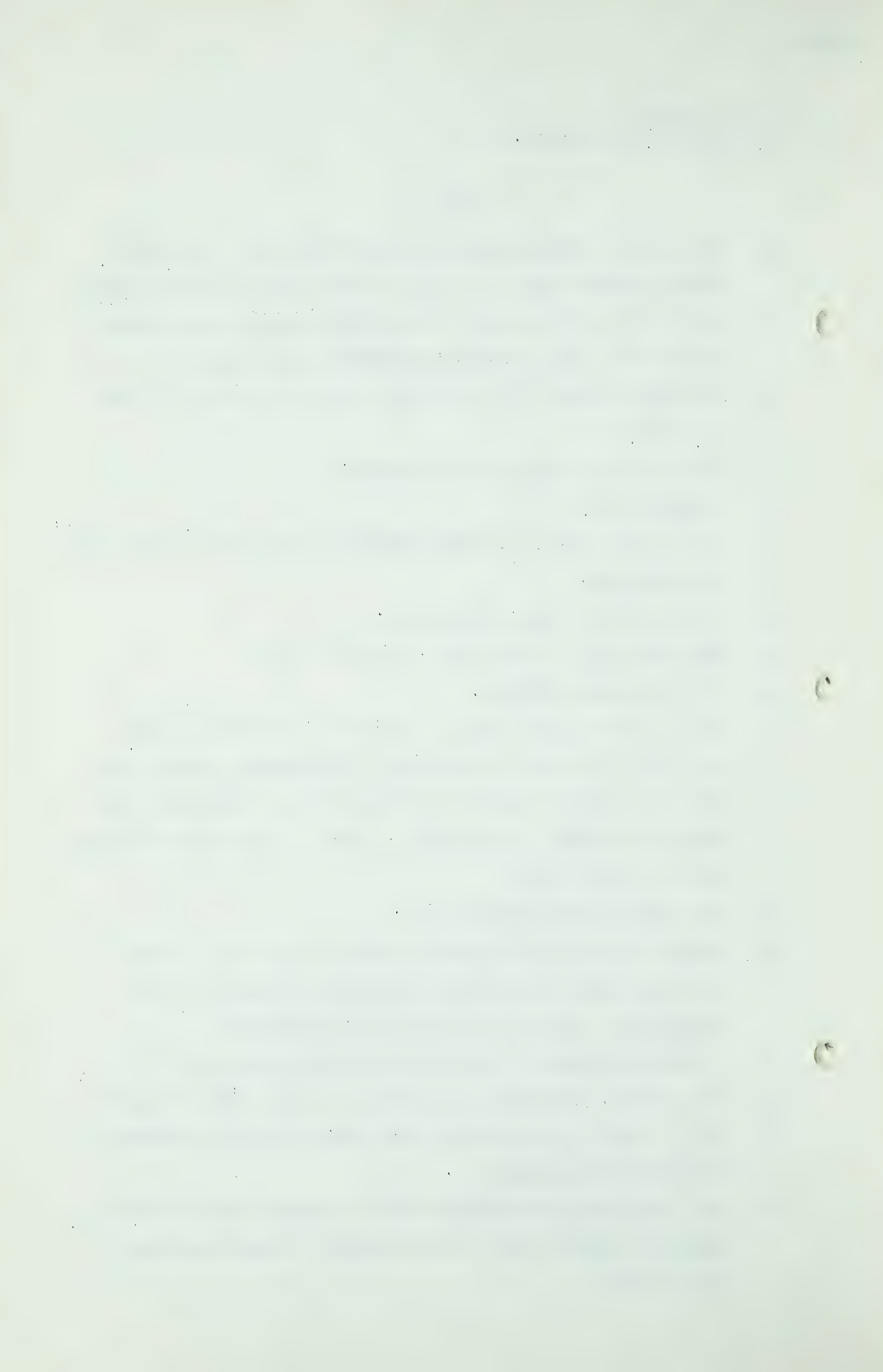
Q Wouldn't you think they would likely say, "This is our territory and we intend to keep that territory if these markets are there and available," if they were?

A I would hesitate to anticipate what they would do.

Q It would be reasonable to anticipate that, would it not?

A Oh, it would be reasonable, sure, that they have probably looked at this market.

Q Yes, and most gas companies like to expand their lines to available markets that are accessible to their services, don't they?



G. B. Whitney,
Cr. Ex. by Mr. S.B. Smith.

- 404 -

A Very true.

Q That is the pattern that gas companies have followed in the United States over the years, they extend and take in territory which they think is tributary to their system?

A Yes.

Q That is the principle on which the Federal Power Commission operates, the territory that is naturally tributary to them is ordinarily allocated to them if they have reserves and can provide the services. There is a bit of priority to the company that is first in the field, isn't there?

A Well, you are asking me to make pretty broad statements.

Q Well, I read the principle to you right out of one of their judgments.

MR. MARTLAND: You did not read it to him.

Q MR. S.B. SMITH: You would agree that is the principle, or did you hear it?

A Yes, I heard it.

Q You would agree with that?

A I was at the back of the room, I did not hear everything but I know the gist of it.

Q You will agree with the gist of it, wouldn't you?

MR. MARTLAND: Agree as to what?

Q MR. S.B. SMITH: Well, it does not really matter, we have the report and whether you agree with it or not I am not much concerned.

A The only thing that I think of with respect to that situation is the Detroit area which was served by Panhandle Eastern for several years and then the Michigan-Wisconsin established their right to go into that market.



G. B. Whitney,
Cr. Ex. by Mr. S.B. Smith.

- 405 -

Q You get into a pretty complicated field down there, don't you, huge pipe lines. It is not comparable to this area at all, is it, from a population point of view or any other point of view, density of population. It is entirely different, isn't it?

A Well, that is quite beyond the scope of my field.

Q Beyond the scope of your field, is it?

A Beyond the scope of my presentation.

Q You are the man who brought that up in that area. Have you any idea of the load factor under which the Northern Company operates?

A No, I do not.

Q 65% is the estimated load factor that you give, is it? Is that your computation?

A That is the result of my computation, yes, based on the figures in Appendix 6.

Q That is not a very high load factor, is it?

A It depends on what you refer to.

Q Well, the higher you can get your load factor the better, there is no doubt about that?

A I would agree to that, yes.

Q You would have liked to have got that higher if you could, I suppose, in your estimate?

A Well, it is no secret that pipe line economics are much better under high load factor conditions.

G. B. Whitney,
Cr. Ex. by Mr. Nolan.

- 406 -

CROSS-EXAMINATION BY MR. NOLAN:

- Q Mr. Whitney, I wanted to ask you with respect to your Exhibit No. 8. You have described the line in some detail and you indicated on the map, Appendix 1, where it is going to run. Now, have you made any study as to the economic feasibility of this line that you are describing?
- A Such studies have been made by our organization, or they are in the process of being made.
- Q Are we going to have the benefit of those studies presented to us at this Hearing?
- A That is not within the scope of my present assignment.
- Q What is your opinion as to the economic feasibility of the line as a whole?
- A Well, I would not express an opinion without the availability of the studies which are being conducted by other members of our organization.
- Q You have devoted yourself exclusively to the market survey, have you?
- A Yes.
- Q Well then, you will be able to tell me, I am sure, that if you exclude Duluth and Superior from your market, then it is not economically feasible?
- A Well, as I said before, I would not express any opinion as to the feasibility of the project without the studies which are being made.
- Q And what would your answer be if I asked you if you excluded all the markets in Minnesota and North Dakota from the project? Would it then be economically feasible?
- A My answer is still the same, that I am not prepared to



G. B. Whitney,
Cr. Ex. by Mr. Nolan.

- 407 -

answer any studies on economies.

Q I wonder, Mr. Chairman, if we would be informed as to that.

MR. C.E. SMITH: Let nobody around this table
start pointing fingers at lack of submissions and so on.

THE CHAIRMAN: You intend to bring in
evidence at a later date?

MR. MARTLAND: There will be other material
filed. I think we are still waiting for some information
as to Northwest Natural Gas.

MR. PARMELEE: If it please the Board, sir,
could I make a short statement on behalf of our company.

THE CHAIRMAN: Yes.

MR. MARTLAND: Is this going to be sworn
evidence, sir?

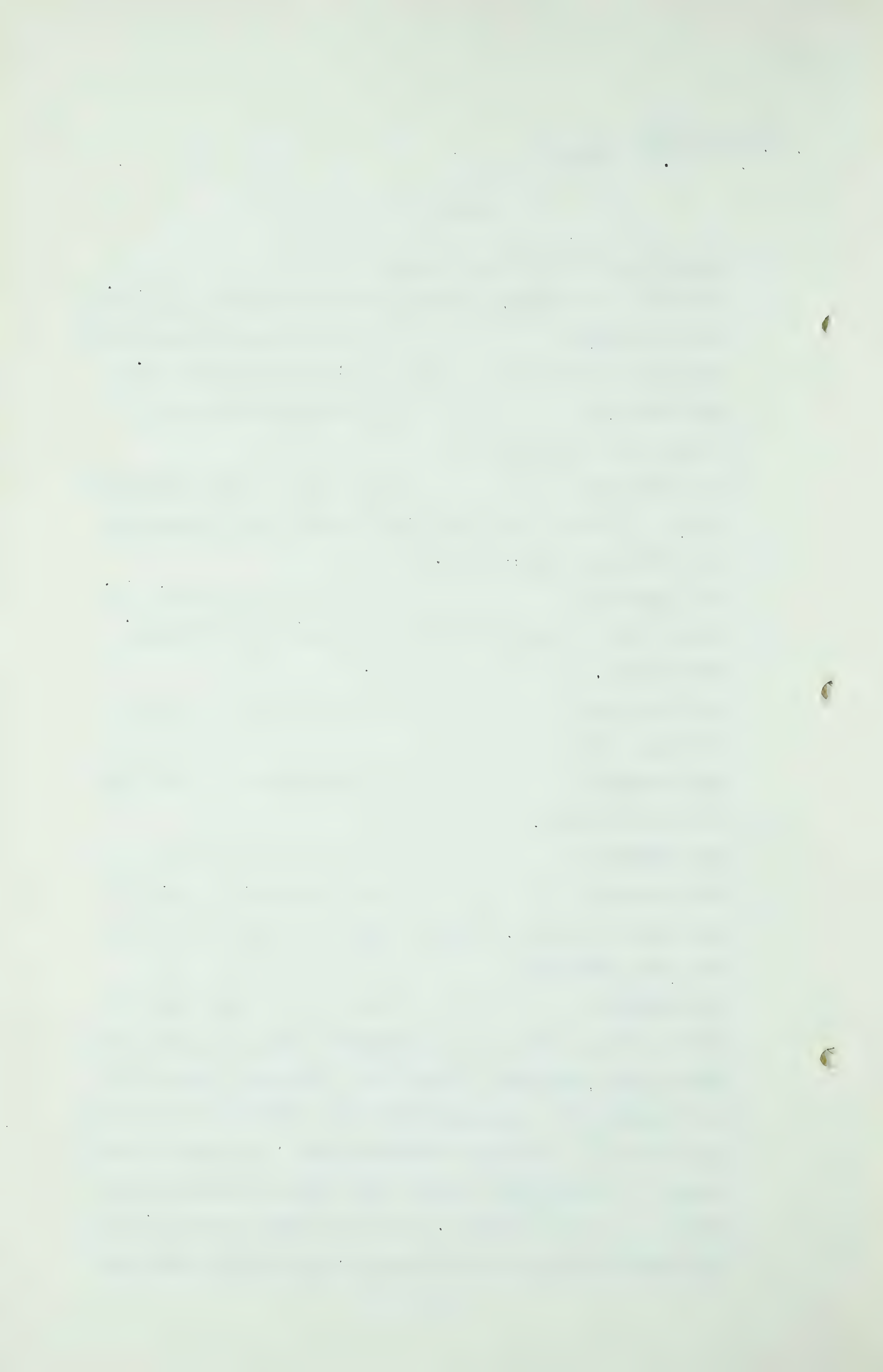
THE CHAIRMAN: It will have to be if it is
going to be given.

MR. PARMELEE: Is it not proper, sir?

THE CHAIRMAN: Just a minute. I think we
are through with Mr. Whitney. Have you anybody else to
call, Mr. Martland?

MR. MARTLAND: Not at this stage, sir.

I was going to refer to the statement which you made this
morning, Mr. Chairman, in which you indicated that should
the disposition of applications be decided without reference
to the Board of Transport Commissioners, the Board at the
request of an applicant would hear further evidence with
regard to certain fields. I would ask that indulgence of
the Board if it becomes necessary, while at the same time



Discussion.

- 408 -

advising that we will comply with the Board's request as to the filing of additional evidence with regard to those matters. That being so, I have nothing further to tender at this stage, sir.

MR. McDONALD: If I might speak to that point, too, Mr. Chairman. I would just like to know when the filings should be made. What I have in mind is this, if we are going to proceed on October 30th, we hope for ultimate saving of time, effort and expense that it would be in order to have as many filings as possible made prior to that time.

THE CHAIRMAN: Well, that was the Board's wish, that as many submissions as possible would be in at least a week beforehand or earlier. That refers to the reserves, of course, and the Inter-Provincial requirements.

MR. McDONALD: I was going to suggest, sir, with regard to reserves and those matters that they be in for some days, if at all possible. On the other hand, I was referring to these other matters of pipe line route and markets, costs, and rates of transportation, etc. As I understood the Board's direction this morning, it was that they must be filed, that the Board made it mandatory and not permissible.

THE CHAIRMAN: Yes, they have got to be filed.

MR. McDONALD: My point there, sir, is that I represent one of the applicants who has had this material before the Board for a good many months, and Northwest Natural Gas has also submitted quite a bit of their



Discussion.

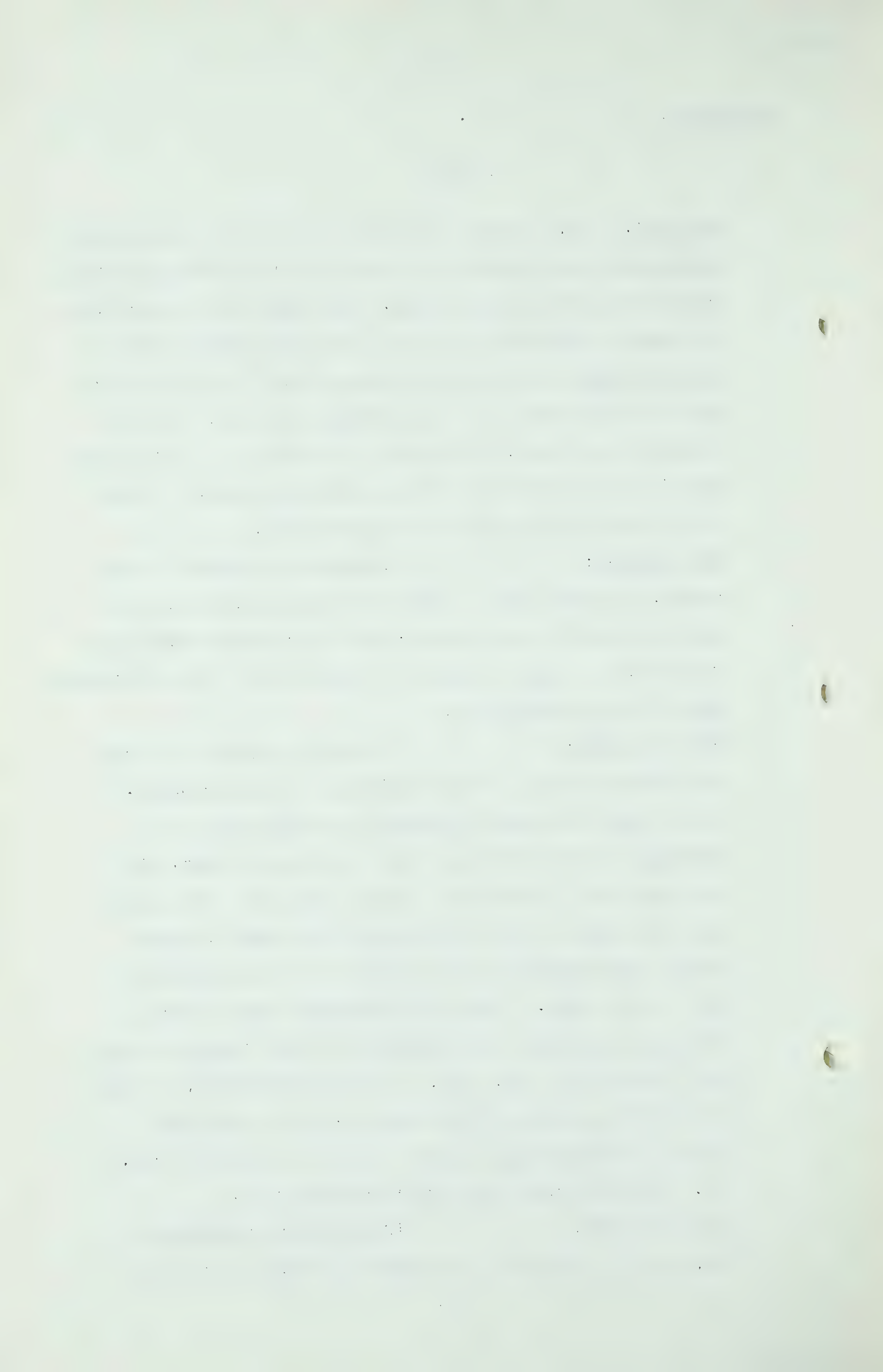
- 409 -

material. Now, I think in all fairness, if the other applicants have that material it should be filed forthwith rather than wait until the later date. And then I also would like to refer to the fact that on the 10th the Prairie Transmission Company are going to proceed and I would like very much to have service of its material, at least, those of us around the table, as soon as it is ready. I would prefer that it not be left with the Conservation Board. I would like to have it served if it could be done.

THE CHAIRMAN: As far as the Board is concerned, we would like to have the other material filed as soon as possible and I think counsel for Western Pipe Lines knows that. I think counsel for Prairie are now distributing some of their submissions.

MR. S.B. SMITH: I would as rapidly as I can make material which we file available to other counsel. As they have been very courteous to me throughout the Hearings, I will endeavour to do the same for them. At the same time, I would only like to say this, I have not any criticism of the other companies but many of their briefs and submissions were handed in as the witnesses went on the stand. That has necessarily been so and I offer no criticism of the companies in that respect at all but I would like them, sirs, to bear that in mind, if they do not get everything right now or just as long ahead of the time as they might desire, I will do the best I can, sir. They have all been very courteous to me.

MR. C.E. SMITH: If nobody has anything to say, might I mention a matter that probably you have in



Discussion.

- 410 -

mind, that is, the question of procedure, schedule, agenda, whatever you want to call it, with respect to the joint Hearing, and I have, I think, spoken to all counsel as to the probability or possibility of meeting with the Board, it does not constitute a Hearing, of course, to see whether an arrangement such as Mr. Martland suggested can be made for procedure with respect to the joint meeting. Now, I think we are all agreed to meet with the Board on Monday, although Mr. Macleod may be put out in the sense that he is going to be away, but I think he realizes everybody else is agreeable and he can send somebody else to help him. I think probably if that could be arranged and announced now, if the Board is agreeable, it would suit counsel to know just when it would take place.

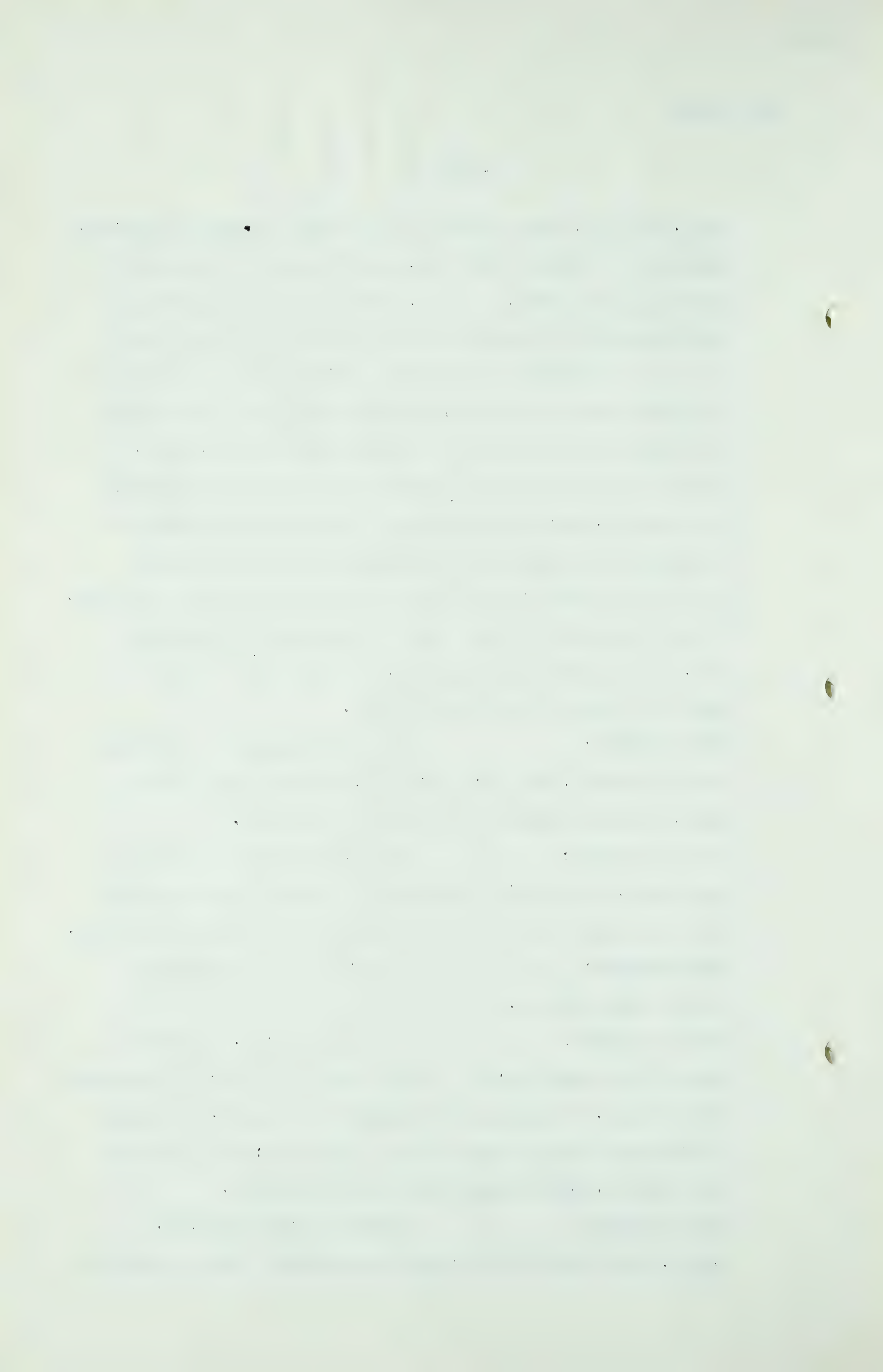
THE CHAIRMAN: We are prepared to meet any time on Monday, say 10:00 o'clock, at the Board office or here, whichever would be the more convenient.

MR. C.E. SMITH: I suppose this room will be available. This being a meeting of counsel I do not know why they should come here, the Board office would be better.

THE CHAIRMAN: There is not as much room at the Board office.

MR. S.B. SMITH: It is now 3:30. We were going to sit until 4:30. I will have to go back to Edmonton, that is all. I presume Mr. Martland will also. I wonder if we could use the hour between now and 4:30 to perform the task Mr. Smith suggests be done on Monday.

THE CHAIRMAN: Well, I understand, Mr. Smith, that some of the counsel wanted some time to consider



Discussion.

- 411 -

the statements made this morning with regard to the evidence they would have to prepare. It would be Monday before they could make up their minds. We would be quite willing to do that, Mr. Smith, but I understand - -

MR. S.B. SMITH: I am quite agreeable to whatever occurs.

MR. C.E. SMITH: Some of them have indicated to me that they would prefer to have that opportunity of looking over the transcript of that statement. I gather the Board will meet any time it suits the convenience of the others.

THE CHAIRMAN: Now, Mr. Parmelee, you would like to make a statement?

MR. C.E. SMITH: Before Mr. Parmlee starts, is 10:00 o'clock the hour suggested?

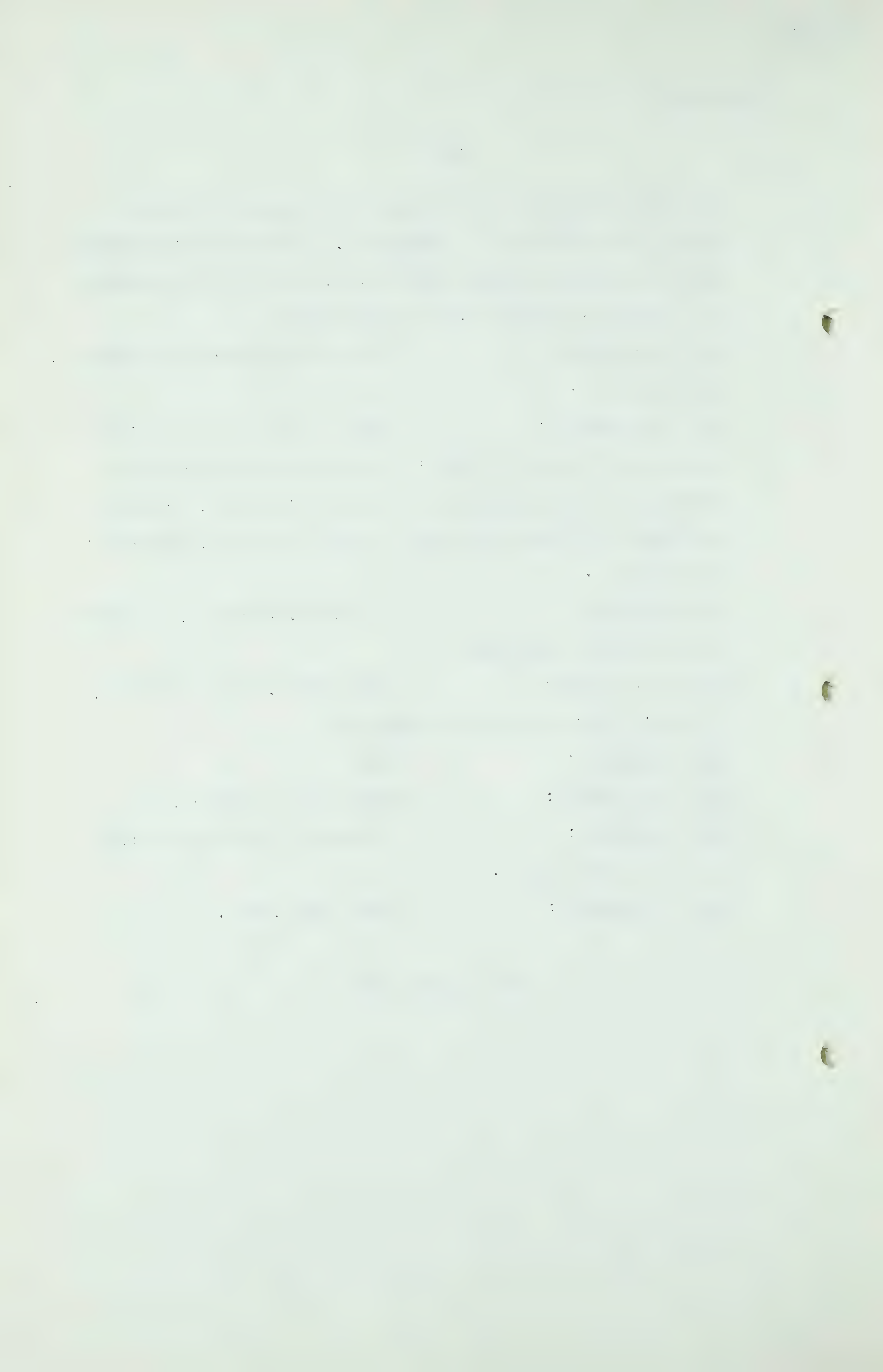
THE CHAIRMAN: Yes.

MR. C.E. SMITH: What about a place?

THE CHAIRMAN: I think it would probably be easier to meet here.

MR. C.E. SMITH: Very good, sir.

(Go to page 412)



James L. Parmelee.

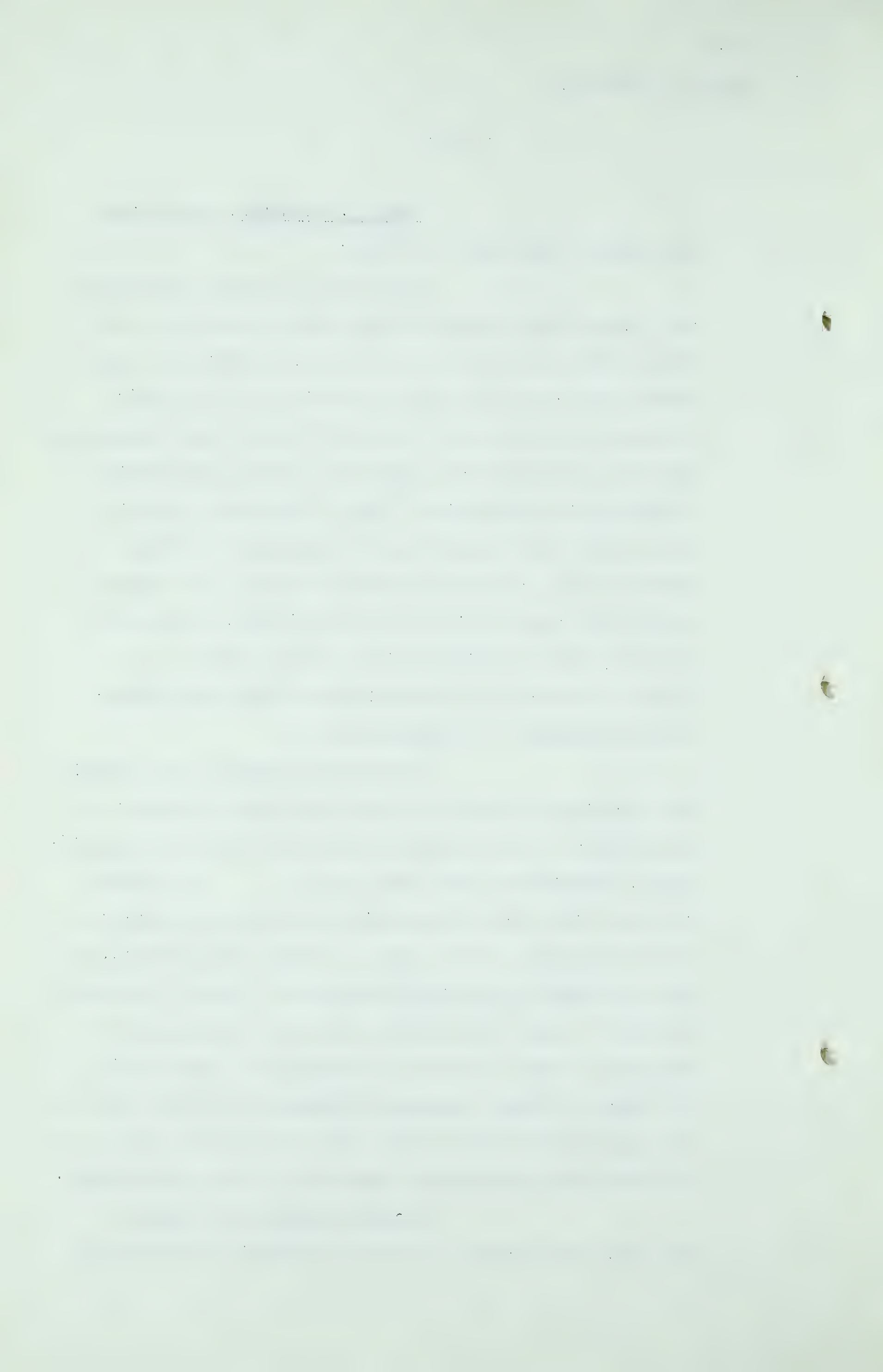
- 412 -

JAMES L. PARMELEE, having been duly sworn, testified as follows:

The Northern Natural Gas Company is a natural gas company as that term is defined in the Natural Gas Act, and as such it must, as must all other natural gas companies, procure certificates of public convenience and necessity from the Federal Power Commission for the construction and acquisition of its interstate transportation facilities. Also, if Northern, or any other person or company, were to undertake to either export natural gas from the United States, or to import natural gas from outside the United States, it would be necessary under Section 3 of the Natural Gas Act to secure an order of the Federal Power Commission authorizing such person or company so to do.

The Northern Natural Gas Company was organized in 1930 and since that time has grown to a size whereby it has a system operating capacity of approximately 600 million cubic feet per day. It operates its pipe lines from its principal sources of natural gas in the Panhandles of the States of Texas and Oklahoma, and from the Hugoton gas field in Southwest Kansas, from which sources its pipe lines extend generally northeastward through the States of Kansas, Nebraska and Iowa and into the States of South Dakota and Minnesota, as such lines are more particularly shown by the small maps which I have here and which are available for exhibits in these proceedings.

Northern Natural Gas Company has long been interested in the possibility of extending

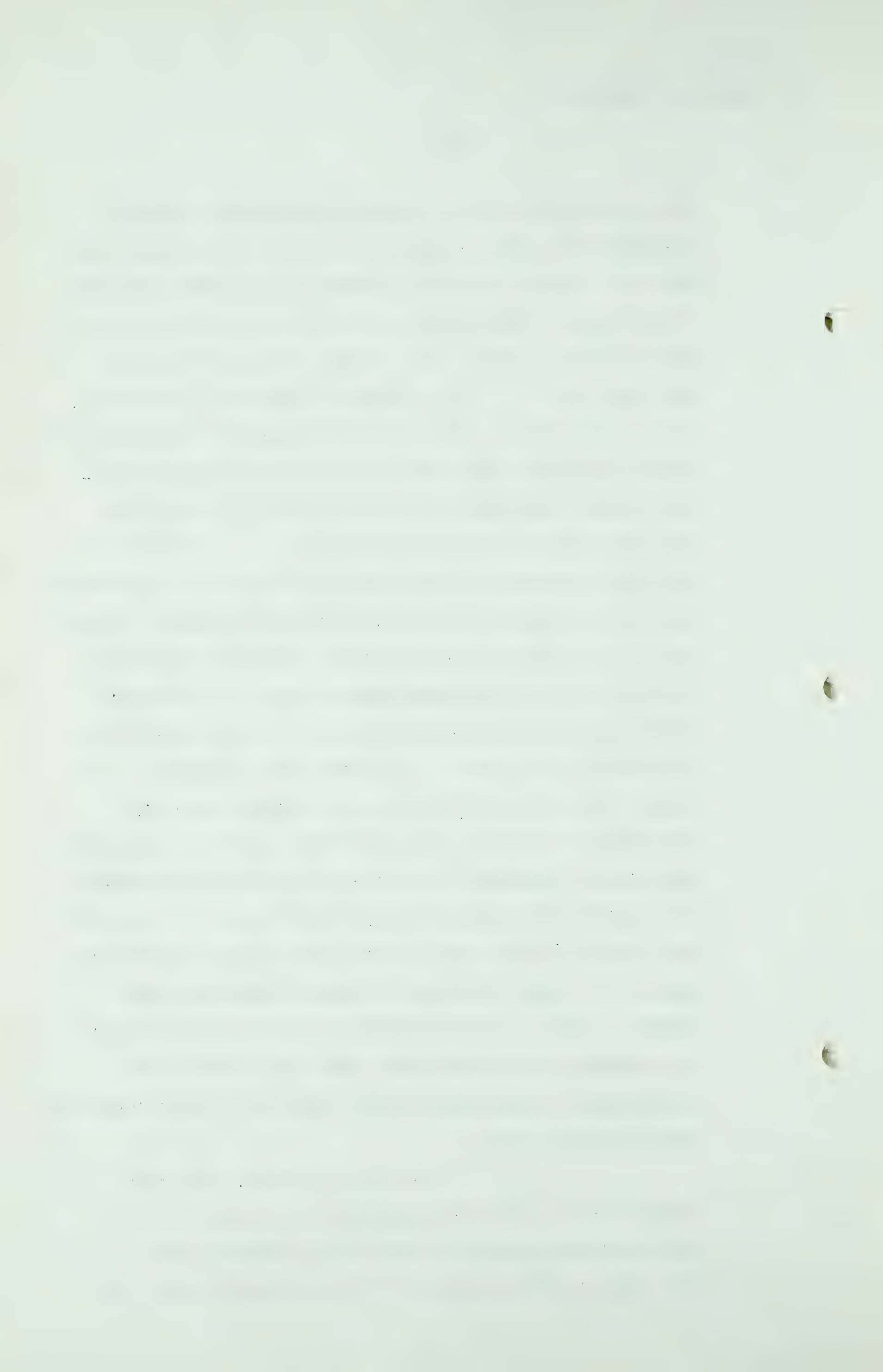


James L. Parmelee.

- 413 -

its natural gas service to the City of Duluth and the so-called Iron Range area in the State of Minnesota, and has made a very considerable study of the markets for gas in such areas. Such studies were made originally in the early 1930's, and have been resumed intensively during the past year. The effects of World War II, as well as the after effects thereof have combined to forestall the natural expansion that Northern has continuously anticipated would some day be made to include the Duluth and Iron Range markets within its service. Northern is very much interested in the prospect of introducing natural gas into its system from any gas fields from where the gas might be brought to Northern within economic feasibility. The prospect of introducing natural gas into Northern's system from the North would naturally be very attractive assuming that the costs of so doing were reasonable because the physical operation of feeding a long pipe line system from both ends, as it were, would be naturally conducive to important economies and operating advantages. It is quite conceivable from Northern's point of view that gas could be flowing through pipelines between Northern's system if it were extended to Northern Minnesota and Canada in both directions should occasion therefor require. I am advised by engineers that this could readily be accomplished by reversal of pipe line flow without important physical difficulty.

It is, of course, true that Northern would endeavor to protect such interest as it may have in the markets in the area of Duluth and the Iron Range in Minnesota, and it seems probable that the



James L. Parmelee.

- 414 -

Federal Power Commission would give careful consideration to the granting of any certificates or authorizations to import in an effort to determine what project for the Northern Minnesota area might be most feasible and economical.

Northern recognizes that there is a possibility of the development of the Iron Range market which has to do with the beneficiating of low grade iron ore by the use of natural gas as a fuel for such purpose. Certainly Northern has no desire to contribute to the obviation of such possibilities, but on the contrary it would like to see these possibilities developed to the fullest extent, and it believes that it is in a natural position geographically and economically at the present time to serve the area with any gas that might be available from the Canadian sources.

Should the Board be interested in Northern's general circumstances, I have available a few copies of its 1949 Annual Report which more intimately shows the general character of its operations than I wish to take the time of the Board to do.

I might also add that Northern Natural Gas Company has reserves committed to it at the present time in excess of 5 trillion cubic feet.

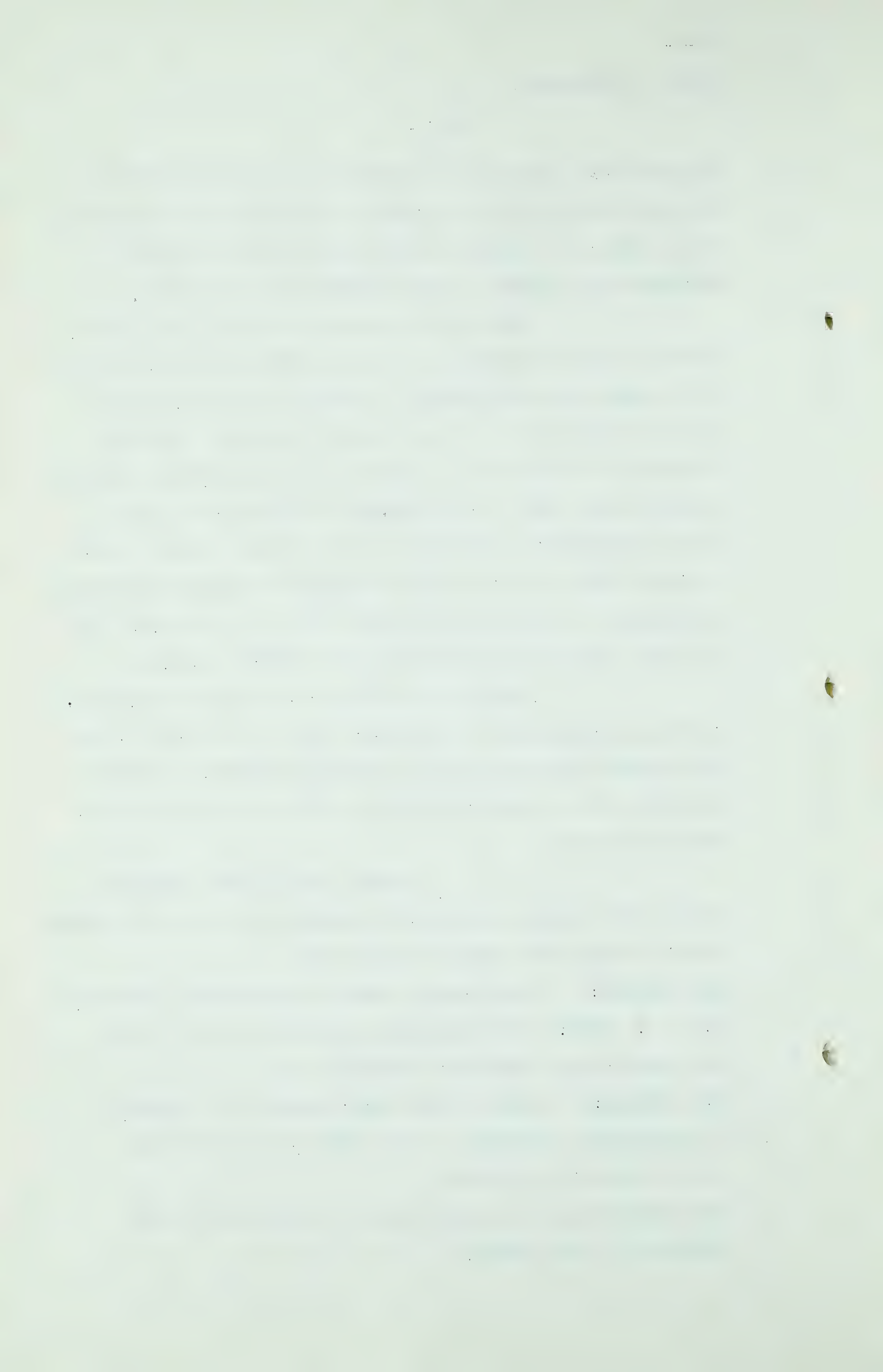
THE CHAIRMAN: Does anybody want to question Mr. Parmelee?

MR. C. E. SMITH: I do not want to question him but I did not hear what Mr. Parmelee's position was.

Q MR. McDONALD: What is your position with the company?

A I am Attorney and Manager of the Exploration Department of the Production Division.

Q The statement you have made has been authorized by the officers of your company?



James L. Parmelee.
Cr. Ex. by Mr. S. B. Smith.

- 415 -

A By the officers of our company, yes, sir.

CROSS-EXAMINATION BY MR. S. B. SMITH.

Q Mr. Parmelee, if a Canadian company or any other company sought to bring Western Canadian gas say from Alberta into the markets at Duluth and the Mesabi Range and the places we have been hearing about from the last witness, of course they could not do so without a certificate of convenience and necessity from the Federal Power Commission?

A That is my understanding.

Q And if any such application were made your company would intervene?

A That is my understanding.

Q Vigorously, I take it?

A That is my understanding.

Q It is your view that this territory belongs to your company?

A We have been making deliveries there for 17 years.

Q Can you tell us, Mr. Parmelee, what load factor your system operated under, say the last recorded year?

A I am sorry, sir, I cannot.

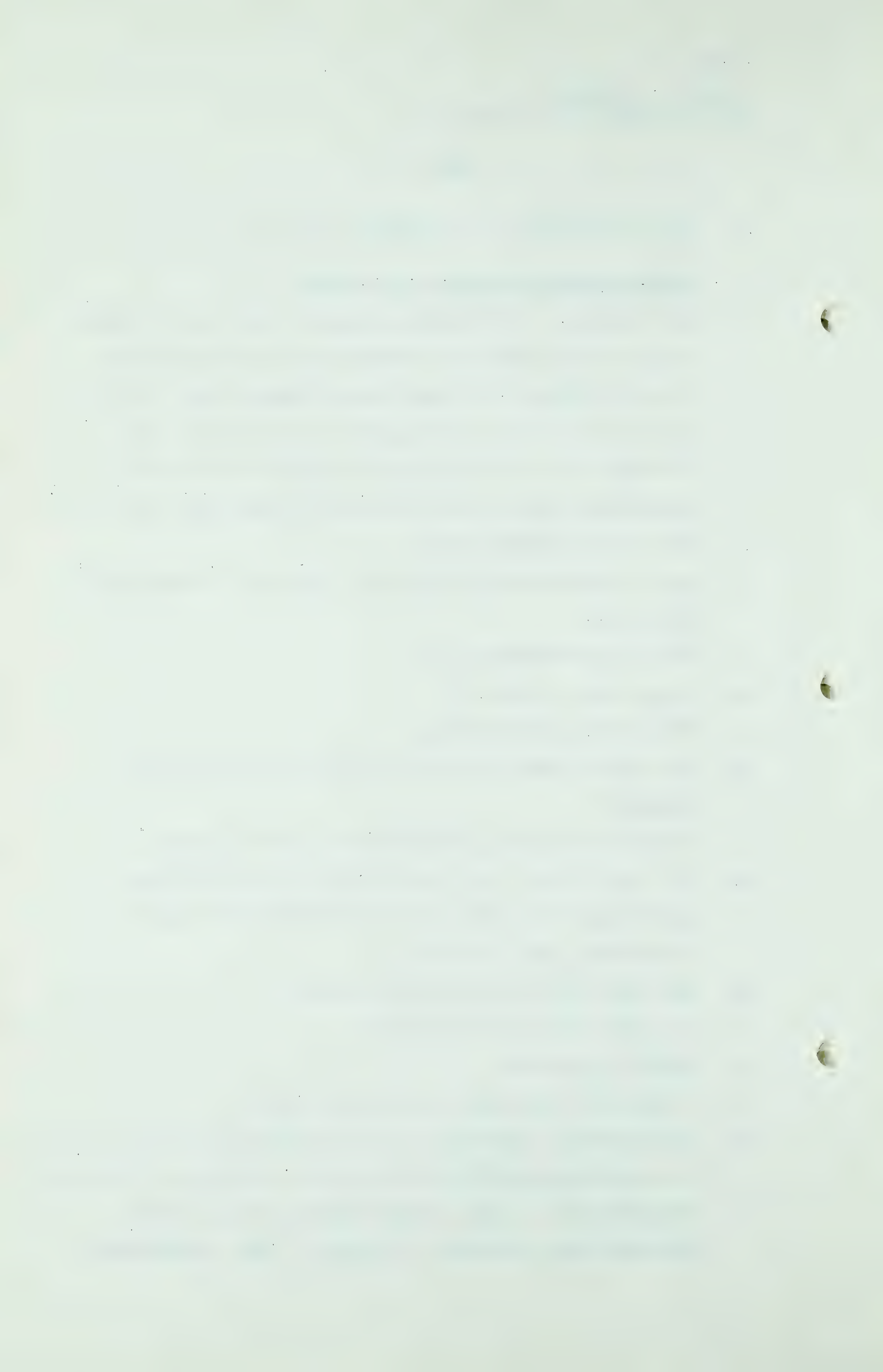
Q Does that show in your annual report?

A I assume it could be computed.

Q There is one here.

A I would not know how to compute it, sir.

Q Some of these engineers around here might be able to. Here is something under Pipe Line System, a statement described "Construction in 1949 - Daily Sales" and the company engineers have estimated, at page 16, that transmission



James L. Parmelee,
Cr. Ex. by Mr. S. B. Smith.
Cr. Ex. by Mr. Martland.

- 416 -

facilities were used to the extent of 91% of the capacity in 1949. Has that any relation to it?

A I believe that is what they call the load factor, sir.

Q Thanks very much.

CROSS-EXAMINATION BY MR. MARTLAND.

Q Mr. Parmelee, your company has apparently made investigations of these markets in the Iron Range territories which were referred to by Mr. Whitney today?

A Yes, sir.

Q And they look attractive to you?

A Well, sir, as I understand it, the Iron Range load is for beneficiating purposes and would make it much more attractive than the present heating load.

Q Your company is interested?

A Yes, very interested.

Q We have had evidence that yours is a company of some substance?

A Yes.

Q A substantial company?

A Yes.

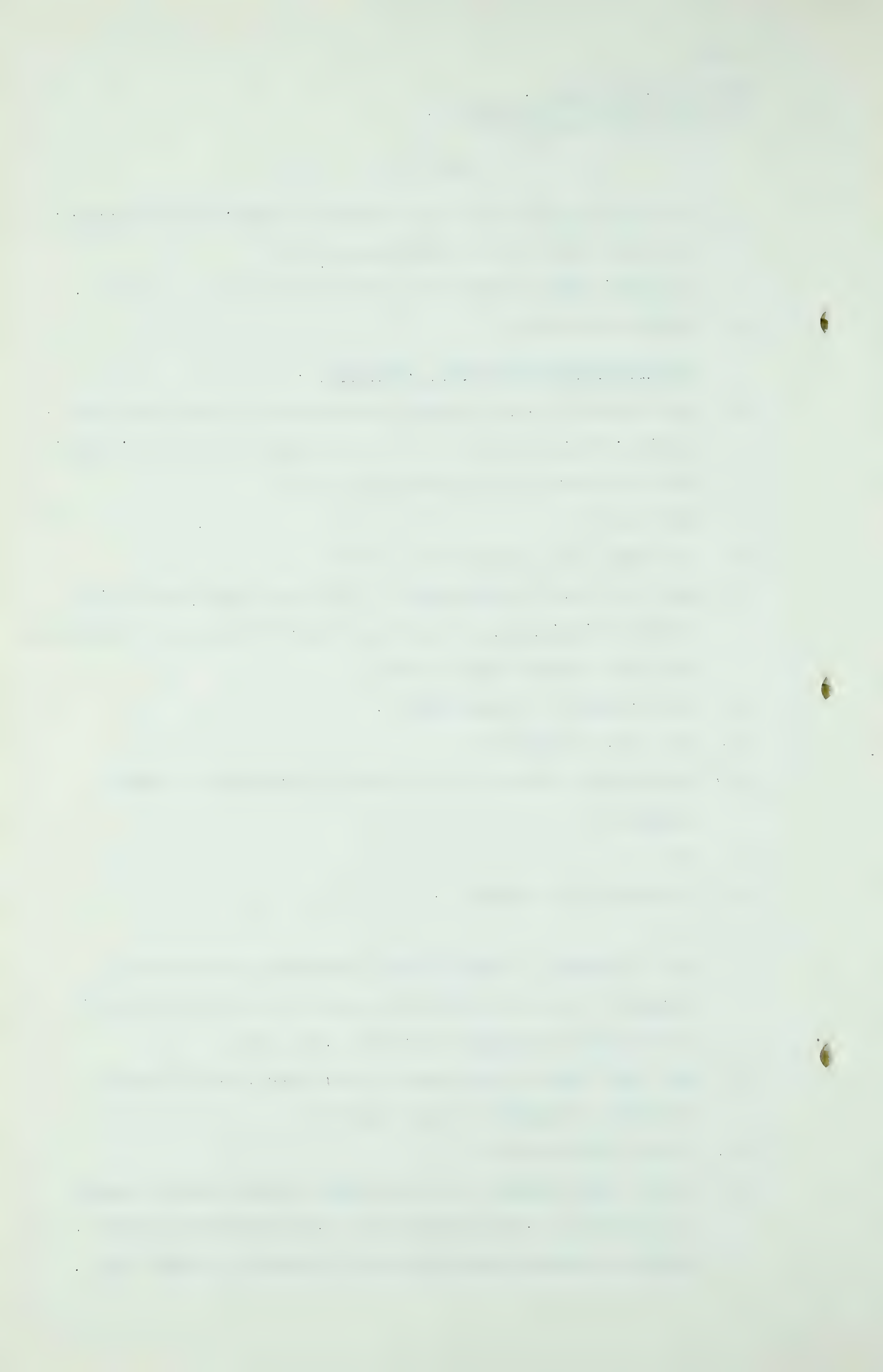
Q And the market is sufficiently promising there that a company of your size would be actively interested in it?

A We have been studying that area, yes, sir.

Q You would like to get gas to serve that market from the Province of Alberta if you could?

A Or any other place.

Q Or any other place? I do not know whether you are aware of it or not - you probably are - that under the application by Western Pipe Lines they propose, if they can,



James L. Parmelee,
Cr. Ex. by Mr. Martland.

- 417 -

to carry gas to the United States border and that they would then dispose of it there to some American corporation?

A Yes, sir.

Q Would you like to buy it?

A If it is available, yes, sir.

Q MR. S. B. SMITH: Have you made any move about obtaining Canadian gas yourself?

A Not at this time, sir. I might add that we have, or are making arrangements to study this area should the Board feel that there is considerable export gas here. We are looking forward to this as a future source of supply because it is closer to us than the Gulf Coast of Texas.

THE CHAIRMAN: Thanks. You have nothing further, Mr. Martland?

MR. MARTLAND: No. I presume that I should apply to adjourn to some date.

THE CHAIRMAN: October 30th.

(At this stage the Hearing was adjourned until October 30th, 1950.)

Q Now, you say that the United States border and that they
would then dispose of it to some American corporation?
A Yes, sir.
Q Would you like to buy it?
A It is available, yes, sir.
Q Mr. J. L. Harrison: Have you made any move about
acquiring Canadian gas property?
A Not at this time, sir. I might add that we have, or are
making arrangements to study this area should the Board
feel that there is considerable export gas here. We are
looking forward to this as a future source of supply because
it is nearer to us than the Gulf Coast of Texas.
Q The Chairman: Thank you. You have nothing further,
Mr. Harrison?
A Yes, I presume that I should reply
to questions to some case.
Q The Chairman: October 1934.

At this stage the hearing was adjourned until October 30, 1934.

